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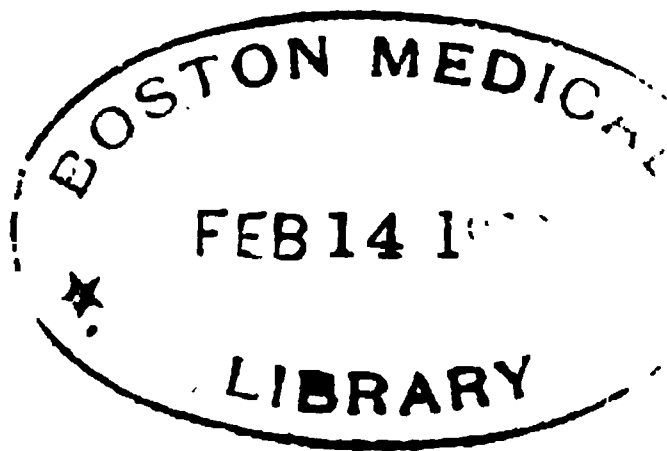
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No. 1

PRACTICES AND CUSTOMS OF THE AFRICAN NATIVES INVOLVING DENTAL PROCEDURES¹

By BENE VAN RIPPEN, D.M.D.,

Cambridge, Massachusetts.

EASTERN AFRICA

THIS paper is not written with an archeological or ethnological object, but is presented primarily to the dental profession with the object of placing before its members something which may be of interest to some as a matter of curiosity, and also that they may more clearly realize the value of our so much advertised and exploited "painless dentistry." For there is no doubt that the procedures, related in the following pages, involve tremendous sufferings to which few, if any, of our patients would subject themselves today.

The writer at first intended to establish a probable link between the customs described and the various tribes, but this task was of a too great a magnitude to be included in the small space of time allotted; yet he does not disclaim that any such connection may exist.

Since early time, and among many primitive races, human teeth have taken an important place in tribal life and have been

¹ To be followed by two articles dealing with the Natives of the Americas and Oceania.

the object of severe measures during initiations, ceremonies and on reaching the age of puberty.

Dental practices among the so-called savages are divided into two classes; one being for the relief of pain, the other a matter of custom. The second, however, is the most important one, being also divided into two divisions, the one being practised with the aid of drugs and so-called instruments, the other with the assistance of some mysterious power or person. But the "dentists" of both the two last named divisions are aware that some, and probably most, of their cures are a mere exercise of ritual and fantastic beliefs, which are very successful at the expense of the ignorance of their fellow tribesmen.

The native mind is always susceptible to anything mysterious and loves to see it carried out, even when a great deal of suffering is to be endured, and although the Kaffirs, for instance, are great cowards in regard to pain, they nevertheless submit to the dictum when once the "operation" is started. They are able to endure terrible torture when voluntarily suffering, but certainly dread the approach of pain which can or may be avoided. The writer has seen them walking about with swollen cheeks resembling small balloons, going to the "doctor," buying roots or barks to alleviate their pain, spending every penny in their possession to avoid extraction of the troublesome element; but after depletion of their resources, they submitted to the decree and without a word allowed the operation, which of course was the most rudimentary one can conceive of, to proceed.

Every tribe or "nation," as they call themselves, has its own dentists and certain customs of practice which are established and maintained. For instance, the Swazis will never pull a tooth before knocking it loose, and when one tells this to a M'Wemba, the latter will shudder at the very thought of it, but is glad to have one pulled by the method of his tribe, though this causes much more suffering. This is due, of course, to habit and, one tribe having always seen its own members being treated in a certain way, is accustomed to this and submits to it, but its members would never allow themselves to be taken care of in any other way except by a "white man's doctor." The writer knows of cases of Kaffirs whose teeth were extracted after a mandi-

bular injection without the slightest pain, which made them think the "doctor" was a wonderful person with unknown powers. When they were informed beforehand about this, they ridiculed the statements as being impossible, but finally allowed the injection, for, after all, the Kaffir, in his native state, looks upon his "white brother" as a superior being and prefers to go to him rather than to his own tribal "dentist."

The dentist is not always the doctor, although this is true in the majority of cases. Often the former is one who has gained so great a reputation for extractions that the sufferers always go to him, much to the displeasure of the doctor, who sees in this a relinquishing of power and influence, something to which the native mind is very susceptible.

The "professionals" of different nations have their own drug prescriptions evolved in time by custom and experience, their healing art being mostly empirical, since no attempt is made to ask the why and wherefore. These men are very powerful personalities in the tribe and often take advantage of their position, although in doing so they admit their inability in certain cases. They are not only called for physical ailments, but also for mental troubles. The writer, when hunting with a party in the Komati River District, arrived one day at a Swazi Kraal and heard a woman shrieking at a doctor that her child was lost in the forest and complaining to him because he did not find her and bring her back. He shrugged his shoulders and moved away, enjoying a pot of Kaffir beer instead.

There is one thing, however, the doctor never escapes from supplying whenever asked, and that is snuff. Everyone knows this and as soon as he arrives on the scene they at once arise, and even when having a supply themselves, will ask him for more. He knows, of course, that some of them jolly him along, but he is also a dupe of custom and obliged to bow to its rules. He collects his own scrubs and grinds them to snuff himself, this being accomplished by rubbing with a small smooth stone upon a larger one. The ground substance is then carefully selected and poured into a small round calabash suspended in a pouch hanging on the waist girdle.

I have wandered a bit from my subject, but will now com-

mence describing the custom which prevails among the M'Wemba Kaffirs of Northern Transvaal and Southern Rhodesia. The illustration, picture No. I, portrays the method in vogue. The patient is seated upon a box or tree-trunk, his head held by one and his legs by another, though the latter cannot be seen, and the "operator" standing behind him as illustrated. The instrument used is the one shown in picture No. II, and is nothing less than an ordinary awl, the point of which is pressed below the gingiva and through the alveolar process in order to reach the bifurcation of the roots; after which an upward prying motion is initiated, and after a few repetitions of these movements the troubling element is removed. That great pains accompany this procedure can be readily understood, for instead of pressing the gingiva down, the operators often simply pierce the mucous membrane at the approximate region of the bifurcation and go ahead with the "extraction."

The M'Shangan tribe of Eastern Transvaal and Southern Portuguese East Africa use the same method.

Francis Galton, traveling in Western Africa and describing his experiences, says:

"I had occasion to inquire for a professional gentleman, a dentist, as one of my teeth had ached so horribly that I could hardly endure it. He was employed at a distance; but I subsequently witnessed at a distance, the operation. He brought a piece of the back sinew of a sheep, which forms a kind of a catgut, and tied this around the unhappy tooth; the spare ends of the catgut (picture No. III) were wound round a stout piece of stick, and this he rolled up tight to the tooth and then pressed with all his force against the jaw till something gave way. I saw the wretched patient sitting for the rest of the day with his head between his knees and his hands against the temples."

This we can all appreciate to its fullest measure, I am sure.

The Swazis of Eastern Transvaal and of Swaziland have their own procedure and it differs entirely from the one (picture No. IV) previously described, resembling the Japanese method, which consists of knocking the element loose and when sufficient movement is obtained, removing it with the fingers. The following procedure is in vogue. The patient lies flat on the ground, his head supported by a stone or piece of wood or anything to raise it above the general level of the body. The opera-

(See text) 1

"Dentist" of the M'Wemba tribe of Northern Transvaal at work.
Photographed by the Writer.

..... Northern Transvaal. No. 1, Instrument used in tooth extraction. No. 2, Bark used for toothache after being ground to powder. No. 3, Root used for swollen cheek. No. 4, String of pieces of hedgehog quills, worn around the neck for the relief of toothache (M'Shangan tribe, Northern Transvaal).

Collected and photographed by the Writer.

tor places himself on top of the patient, his knees on his chest, with an assistant holding his head.² Placing a small stick made for the purpose against the tooth, he gives it hard blows with a small stone until the object of attack either falls out or is removed by hand. Whether fractures sometimes result could not be learned, but it cannot be doubted that large pieces of the alveolar process are lost. The supposed reason for raising the head is to make the work easier, but it accidentally coincides with the fact that it will prevent the loss of unnecessary blood, due to higher pressure by gravitation.

In the olden days of the early Boers, in Northern Transvaal, another method was in use, the authenticity resting with a descendant of these earliest Trekkers, though also substantiated by others, the details having been related to them by their respective forebears and repeated personally to the writer.

The Negroes in these parts, who were members of the Makatse tribe, related to the Zulus, when troubled with toothache, were brought to the "expert," who, after looking about for the offending element, tied to it a thin but very strong sinew, which was in turn tied to a spoke of an ox-wagon wheel.³ A piece (picture No. V) of iron was then heated to a white heat and suddenly thrust close to the face of the subject, who, afraid of being burned, forgot all about his tooth and, thinking only of the danger in front of him, pulled away, after which he realized that he had extracted his own tooth. There was, of course, a danger of breaking the sinew, but especially strong ones were selected in order to avoid this. This method seems to be the most scientific one, judged from the physiological viewpoint, the lesser stimulus being inhibited by the greater, which is a good example of reciprocal innervation. The methods just described are the only ones it was possible to find out about, with the exception of one spoken of by Galton, although others may be in vogue.

The treatments to alleviate pain or to relieve toothache are done either with the aid of roots, leaves, etc., or with the help of charms. It is rather difficult for a visitor to obtain these things

² The writer had no opportunity to acquire the services of the fourth man, required in picture No. IV, to hold the patient's head.

³ The man holding the sinew takes the place of the ox-wagon wheel.

from the native doctor unless he speaks the language, and this compelled the writer to rely on an interpreter, who in this case was a Swazi-Basuto. He, of course, had little or no influence with his more learned native brother, which impaired my success very much. After hearing our request, the doctor simply smiled and turned his grease covered head in the other direction, leaving us standing like salt pillars in the desert. We were finally successful with someone else, from whom the writer, paying the goodly sum of eight shillings for the two, bought a piece of bark and a piece of root that were supposed to possess rare and wonderful healing powers. To these two was added later a piece of CuSO_4 , the ordinary commercial kind, its beautiful dark blue color seeming to the native mind to add to its healing powers. This last is a modern product and introduced by the white man, probably the early Boers.

Neither the name nor the source of the bark could be obtained, but its use I was instructed in. The M'Wemba tribesmen, using this particular bark (picture No. II) are told by their doctor to grind it to a powder, a little of which is placed in the hollow of the hand and a few drops of water added. After allowing a short time for the powdered bark to absorb some water, a little of it is placed in the cavity of the carious element and the pain is supposed to disappear in a very short space of time. For a swollen cheek, a piece of a root of a certain scrub (picture No. II) is used in the following manner: After insertion in hot water, the root is covered with fat, which may be from any animal, is held for a while, and then rubbed against the inflamed area at different points and at short intervals. This procedure is repeated again and again. The outside is so treated first, after which the same process is continued on the inflamed mucous membrane of the affected region. After a while, the pain will cease to be severe and the swelling will subside, if not disappear. The validity of these claims has not been *proved* by the writer, but he hopes they will be in the near future.

The second class of remedies are in the form of some substance supposed to have a beneficial action by virtue of its mysterious power. The illustration (II) shows one, being a string of pieces of hedgehog quills hung around the patient's neck with

III

This method is used by a Western African tribe, the name of which could not be
obtained
Photographed by the Writer.

IV
The Swazi method of removing teeth.

Photographed by the Writer.

— 2 —

the understanding that this will cure the toothache. This is so firmly believed in by the natives themselves that the faith in its "healing power" has even affected some white people, and as a matter of fact, this very string here illustrated was worn by a mining engineer who showed it to Dr. J. F. Verceuil of Pretoria, saying that he had worn this for a couple of weeks, but could endure the pains no longer, and had to come to him for relief. He reached under his collar and produced the illustrated specimen as a proof of his statement and his faith in its beneficial effects.

All sorts of different substances are used for this purpose, the number and variety depending only upon the ingenuity and resources of the native doctor. This only proves that they are being exploited, although, I suppose, some of these "dentists" really believe in them. This also explains why the chiefs and the doctors are the wealthiest members of the tribe, each of them boasting of a number of wives, which in their lives is the real index of material prosperity, each wife representing a certain number of oxen—the ox being the basis of all native barter.

So far I have confined myself to descriptions of practices aiming at the cure of toothache, but will now take up the matter of different customs involving extractions and tooth mutilation.

The Wakamba (2) and Taiita have their front teeth sharpened to a fine point. When their mouths are open they resemble a crocodile or tigerfish. The Pygmies have the upper incisors and canines sharpened. This is done by inserting a block of wood in the mouth and against the teeth and chopping with a miniature axe. The Wapaii and Wachaga pull out one tooth from the center of the lower jaw. The Wandai, Masai and Kavirondo remove the two middle teeth of the lower jaw, whilst the Banyoro and Batora remove six. These teeth are extracted from both boys and girls when young.

The tribes mentioned inhabit middle and northeastern Africa, south of Abyssinia.

The writer had the good fortune of witnessing a great Kaffir dance arranged for his benefit, and while each of the seven tribes⁴ represented performed its fantastic dances, he noticed a great

⁴ These Kaffirs represented seven tribes from Portuguese East Africa.

number of them with filed anterior teeth and also saw many who possessed no anterior teeth at all. The latter condition was no doubt due to decay following the removal of too much tooth structure, either by filing or chipping or by filing alone, in order to color the teeth, this being more easily accomplished with the dentin exposed. Both sexes of the Machoppees practise these customs and when questioned about the reasons of their origin, no definite information could be obtained except that they were the customs of the nation.

The method used in chipping is that of holding an iron instrument sharpened at one end against the mesial or distal margins and striking sudden sharp blows. The hammering is done with a small stone specially selected for the purpose and by a member of the tribe who has previously acquired skill in doing this work. It is customary to file both the superior and inferior incisors.

Gouldsbury (3) and Sheane, traveling through Rhodesia, have this to say on the subject:

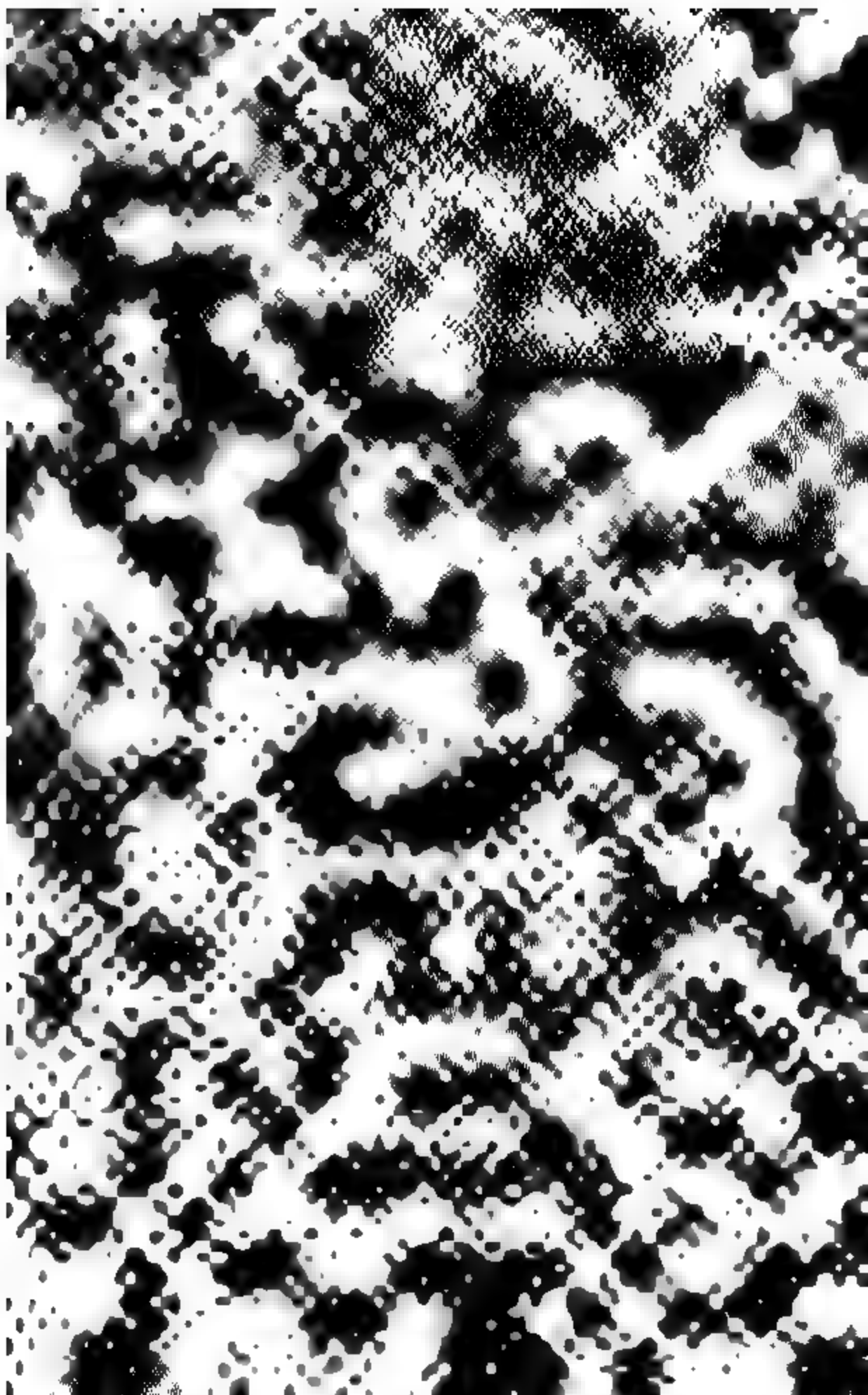
"There are many methods of teeth deformation. Many Bisa and Wemba file their teeth down to a sharp point, giving a curved, shark-like appearance to the mouth, and this fashion is said by them to be derived from the cannibal tribes of the Congo. Other tribes file their teeth in serrate fashion, but no special deformation can be said to be the peculiar hall-mark of one tribe, as it seems to be more a matter for the taste of each individual. Mambrue and Winamwanga men usually knock out two, or even four, of their lower teeth. In each village there is a dentist who performs these operations, knocking off the teeth level with the gums with the sharp blow of an axe-head driven home with a wooden mallet."

Galton (4) again describes the following:

"In front of us, to the north, was the hill Eshuameno, so called from a grand feast the Damaras once held there, on occasion of 'chipping' the front teeth of a number of children. The Damaras knock out a wedge-shaped gap between their two front teeth. The ladies say it makes them lisp charmingly."

and Patterson (5) (page 128) says: "The Wa-Taita of the East African Protectorate, between Mombasa and Tsavo, have the most curious custom of filing the front teeth into sharp points, which gives the whole face a most peculiar and rather diabolical

Method in vogue among the Makatse tribe Northern Transvaal.
Photographed by the Writer.



VI

Chipped teeth. Bopoto tribe, Northern Congo. The upper teeth are chipped to sharp points with a small native chisel. It is done when the baby or girls are fifteen years old and able to bear the pain. The "operator" is paid a small fee for his "skill".
"Customs of the World," page 745
(Reference 23)

expression," and again (6) we read that the Wa-Kamba of the Unkami Province have the same custom of filing the teeth as the Wa-Taita.

The Masai (7) of the Athi plains of the same Protectorate have a curious custom of extracting two front teeth from the lower jaw. It is said this habit originated at a time when lock-jaw was very prevalent among the tribe, and it was found that if these teeth were pulled out, food could still be taken. This explanation seems scarcely satisfactory or sufficient, and I give it only for what it is worth; but whatever the reason for this custom, the absence of these two teeth constitutes a most distinctive identifying mark. I remember being out with a Masai one day when we came across the bleached skull of a long defunct member of the tribe, of course easily recognizable as such by the absence of the proper teeth.⁵ The Masai at once plucked a handful of grass, spat upon it, and then placed it very carefully within the skull; this was done, he said, to avert evil from himself. The Masai do not file their teeth.

In the district (9) from Nairobi to the Kedong River and in the Kenya Province dwell the Wa-Kikuyu, who are similar to the Masai in build, but not nearly so good looking. Their front teeth are filed to a sharp point in the same manner as those of nearly all the tribes of Eastern Africa. Scoresby and Routhledge (11) say: "The Masai, too, invariably remove an upper incisor in order, they declare, that they may be fed with milk when the jaws are clenched with tetanus." And again Powell Cotton (10): "All the Masai have their two lower front teeth extracted, which, they say, enables them to spit straight, for even now spitting takes a great place in a Masai's life. They spit at meeting and parting, on any young child they come across, on seeing anything unusual, to clinch a bargain, and, in fact, on about every conceivable occasion." The dentist's fee is a load of flour.

Most of the men (20) and women of the Masais knock out the lower incisor teeth, this being done, as they say, to prevent starvation during lockjaw which at one time was a scourge amongst them.

⁵ This cannot be accepted as a proof, there being many tribes which have this custom, and one representative may easily have died in the Masai region.

Regarding the M'Kikuyu:

"These natives (12) are constantly polishing their teeth with a green stick which has been chewed at one end so as to form a brush, and they say they use charcoal or a form of soft stone as tooth powder. Filing is not practised by the M'Kikuyu." "They (13) have good teeth with very little caries. In cases of decay and extreme pain a tooth is removed by breaking away the wall of the socket with the point of a knife, tapped on its butt with a stone and resulting in considerable damage."

Following is a quotation (14) about the M'Kikuyu of British East Africa:

"The reputation and prestige enjoyed by different medicine men varies greatly, but the sum of their individual and collective powers in the land is very great. No man otherwise than intelligent would attempt to enter the profession, and if he did, he would be refused. The calling is not necessarily a hereditary one, nor does it seem to be associated with the accumulation of wealth. Influence and a substantial competency appear to be its general reward. The expense for treatment is great. In one case the medicine man directed that three goats should be killed, but refused the fee, as the patient could not recover."

Irregular (15) practitioners are poisoned. Surgery (16) is not associated with medicine. It is practised by anyone who is naturally deft and no doubt such an individual acquires a local reputation.

Almost (17) all the Babira people under their varying designations, and some of the Boamba, file the front teeth of the upper jaw to sharp points. The Babira Negroes are scattered over Uganda and the Congo, and probably over entire Central Africa.

The Rev. Wilson (30) in the course of his missionary work in the neighborhood of Bahr-el-Ghazel, Soudan, met with a race of people known as "Jieng," amongst whom for some reasons apparently unknown to themselves, the adults have six of their lower teeth removed.

The Bantu Kavirondo (18) usually pull out the two middle incisor teeth in the lower jaw. Both sexes do this. It is thought that if a man retains all his lower incisor teeth he will be killed in warfare, and that if his wife has failed to pull out her teeth it might cause her husband to be punished.

The Ja-luo (19) tribe, one of the Nilotic, pull out the incisors in the lower jaw, and also the cuspids, particularly from the mouths of boys.

The Turkona (21) of Uganda remove one of the lower incisors.

The Nanna (22) pull out the two middle incisors in the lower jaw, and a chief or medicine man has, in addition, one of the upper incisors removed.

This survey of eastern Africa gives us fairly good reasons to believe that chipping and filing is practised by many tribes of that region, and it is well to bear in mind that the "Masai," supposed to be a race having some Caucasian blood, do not practise it. Also, the natives along the southeastern coast do not seem to have practised it as judged from the skulls of that region. It certainly is not in vogue at the present day.

THE CONGO AND WEST AFRICA

The Congo seems to be the place where these customs still prevail to a greater extent than anywhere else in Africa, and, although they are losing their significance as to cause and effect, they remain behind as remnants of the past and still form an inherent part of native life. The Duke of Mecklenburg (23) comments on this (see picture VI):

"It is very difficult to obtain accurate information regarding cannibalism, which is still occasionally practised in secret, but upon which severe penalties are imposed by the European authorities. Many customs are so deeply rooted that they resist for a long time the influence of civilization.

"A small boy employed by the expedition had so far lapsed from the tradition of his race that he called the old men 'Your Nigger.' Yet he was not to be dissuaded from the disfiguring custom of sharpening the teeth, and one day he had his splendid teeth filed to a point. A 'Mi-Lsanga' idea of beauty will not permit him to leave his teeth in their natural condition."

The writer takes exception to the last statement in so far as the tribe is concerned. They may do this in the Congo, but certainly not as a collective nation, and those members who live in the Eastern Transvaal and Portuguese East Africa do not practise filing or chipping, but perforate their earlobes, a fact by which they are easily recognized. The writer has examined

natives from both these regions. The Congo Pygmies (24) seen by him had their superior incisors and cuspids sharpened to a point after the custom of the Babira negroes.

Weeks (25), another traveler and explorer of the Congo, saw them chisel their superior incisors, the pain of which they were taught to endure. Some had only two cut, while others had four. This "operation" was supposed to improve their appearance. He relates the following incident: "I said once to a native: 'Your teeth are like a dog's,' and his quick reply was: 'Well, your teeth are like a cat's.' They paid two brass rods for having them cut, and two brass rods every time 'they bit the operator.'"

The Akela (26) knock out all their front incisors (picture No. VII), both superior and inferior; the reason given was that it was the "fashion." The village blacksmith places an iron wedge against the tooth and hits it with a block of wood. The tooth is thus broken off. The result is they cannot eat normally, so they hold a knife between their toes and cut off mouthfuls of meat by drawing it along the edge.

That the different travelers ascribe to certain customs different reasons may be noted by quoting Swann (27), who says, "I met a native, his hair daubed with grease and his teeth are filed sharp to tear raw meat. His features were of the low type so characteristic of these men who are found in great numbers on the upper Congo River." This author is followed by Talbot (28), who describes the Nyanga as "being a small tribe and are renowned for their knowledge of medicine and magic. They live near the River Tegatt in Nigeria. In front of our tent door was a tall carved pillar, ornamented with strings of human skulls. The people all had the filed teeth and thin shrunken appearance usually associated with cannibal rites."

Sir George Grenfell (31) (picture VIII) seems to have paid more attention to teeth mutilation than any other traveler through that part of Africa. He says:

"Mutilation of the teeth seems to be quite as much in vogue in the Congo basin as it is in that of the Zambesi or in East Africa. Among the Bakongo, two middle upper and lower incisors are sharpened to points, or are slightly scooped in a semicircle. On the Luango (Kakongo) coast the men still file their upper front teeth in semicircles, so as to reduce to first and second incisors and canine on each side to sharp points.

VIII

A picture of a Chichiri boy, from the Bassongo district, South Western Congo. This boy was a slave, captured and brought to Bassongo where he was bought by the Louisiana Purchase Exposition as a member of their "Pygmy" group. This type of tooth-filing is common to many tribes of the Congo.

F. STARR, "Congo Natives," page 190, Chicago, 1912

(Reference 31)

VII

An Akela of Southwest Congo cutting up his food, holding the knife between his toes.
(Reference 26.)

IX

Marisaka, a Southern Rambala woman, from the Head Waters of the Niger, showing
superior incisors filed to a point
(Reference 29.)

Most of the riverain tribes of the North, South and East leave their teeth alone. But a great many of the peoples of the center and northeast file all the front teeth in both jaws to sharp points. This is particularly characteristic of the Ngombe and Bangola; and of the Basongomeno between the Kasni-Sankuru and the Lukenye, whose very name means 'they sharpen teeth.' Some of the Bakusu, Basonge (Bakuba), and Manyema adopt the same practice, as do many of the Ammini tribes; and such of the Pygmy people as are in close contact with them. The Eastern Manyema chip a diagonal space between the middle upper incisors.

"Sharpening the front teeth to a point coincides, to a certain extent, 'with the practice of cannibalism,' but not invariably. The filing is sometimes done in the upper jaw alone, more often in both jaws, and is performed on the four incisors and two canines, so that all these six teeth are reduced to sharp spikes.

"I have not encountered records of many tribes from the central Congo basin that actually remove or knock out teeth. But the Babira in the extreme northeast, on the edge of the Sturi, knock out the lower front incisor teeth, borrowing the custom apparently from the Nilatie Aluru. Some of the 'Southern Ngombe' or Malunja (south bank of the northern Congo) extract the two upper central incisors. The Bayaka, who ordinarily file their teeth to sharp points, occasionally knock out the central incisors instead, and in consequence retire to the bush for ten days to nurse the severe neuralgia that results. The Baloi of the lower Mubanzi have a very distinctive appearance on account of the four front teeth having been pulled out. For this or some other reason they are averse to opening the mouth."

The Wadama (29) (picture IX) of the Northern Kamerun also have the habit of filing and are, in contrast with the Nyanga, a finely built race, taking much pains as to their personal appearance. The custom is dying out and is no longer practised by the youths of the tribe.

BRITISH CENTRAL AFRICA

In this region of Africa we find also the mutilations, and one author (32), speaking about these parts, says:

"As to the teeth it was an astounding wonder to me that the way they were treated did not ruin them entirely; but it does not seem as if chipped teeth decayed any more readily than whole ones. Naturally, as most travelers have reported, natives usually have splendid teeth. The Yaos chip the edge of the four upper front teeth into saw-like points. This is usually done to boys and girls at about fifteen or sixteen. I never saw the operation performed, but fancy that a mallet and chisel are the instruments used. The Mambroe (on the Nyasa-Tanganyika

plateau) have the two middle teeth of the lower jaw removed. One of them told M. Foa that they were knocked out with an axe, adding, 'it is very quickly done.'"

A triangular gap between the two upper front teeth⁶ is made by different tribes—the Anyika of Northwest Nyasa being one. Some of the Makua tribes file each separate tooth to a point, as shown in No. IV of the illustrations; this is also done by the Basenga. The Batonga knock out the upper front teeth, or did so, in Livingstone's time. When questioned respecting the origin of the practice, the Batoka reply that their object is to be like oxen.

The Baganda (33) children when losing their teeth are assisted by their guardian to get rid of them quickly. Yet they seldom, if ever, extracted them for a child, but persuaded him to do this for himself. They induced the child to believe that if the tooth were drawn and placed in a rat run, the rat would take the tooth and replace it with a few cowry shells. The child would try this plan, extract the tooth, and place it in the rat run, and early next morning would go to see the result. Of course the guardian had seen to the removal of the tooth and had put two or three cowry shells in its place. The idea was that if the teeth were not extracted at the right time, the new set would be irregular. Here we find one essential fact in orthodontia, practised by a primitive race.

A. Ecker (34) describes a skull found in Northeast Africa in which a superior right incisor was found to be missing and the alveolar process entirely flattened, which proves that it was done some time before death, while all the other teeth in situ were perfect, healthy elements. Two other skulls from Dar-Fertit show in one the superior incisors only, but in the other both the superior and inferior incisors filed to sharp points.

Marno (35) tells us that both sexes of the Dinka tribe in the Sudan remove the inferior incisor, but never touch the first dentition. The same custom prevails, according to this author, among the tribes of Bahr-el-Abiad.

Schweinfurth (36) mentions the "Shilluk" negroes, inhabiting the upper Nile delta, who file their inferior incisors, which are

⁶ Illustrated in Picture No. X.

very soon afterwards lost or pulled out. The Bongo extract their lower incisors only, which is an unknown custom to the tribes living nearby, but they file their upper incisors. This they do in a peculiar way, viz., filing at the gingival mesial and distal margins, resulting in a space large enough to allow a good-sized toothpick to pass through.

The Niam-Niam of Central Africa file their incisors to points and, according to Schweinfurth, this is done by a youth in order that he may be allowed to become a warrior.

Nachtegal (37) finds that in Baghirmi, the Somrai remove one, the Sara two and the Bái four superior incisors.

Von Jhering (38) quotes "Marché," saying that the custom of filing the superior incisors was in vogue amongst the Okandes, where he saw three young men all having the teeth attended to in the same fashion. The Benda or Banta tribes of the west coast do the same.

Hartmann informed Von Jhering in 1874 that filing the teeth to a point was practised by the Matumboko, Mongonga, Agawa and Amatonga. The latter are near the Delagoa Bay district and are the most southern tribe having this practice. The Damaras⁷ are said to be the ones most to the north who do it, and this seemed to point to a connection with the inhabitants of the Upper Nile.

P. du Chaillu (39) describes the Apone, living in equatorial Africa, who extract the superior centrals and file the remainder to a point. On another page he mentions the Famine and Fams, whose King had his teeth filed to points and stained black. He again (40) mentions that filing teeth to points is a custom of the Otando, Apono, Tschago and Ashango tribes. Globius, quoted by Von Jhering, (41) speaks of the Sierra-Leone coast, saying: "The bride goes with the bridegroom to the smith, who files her anterior teeth, after which they go to the temple, where the tribe's 'charmer' or 'doctor' makes holy their union."

Winterbottom (42) informs us as follows: "The custom of filing teeth to a point is a general one in use. The Bullamer and Timmaner also do this, but it is not a generally adopted custom."

⁷ There seems to be an error either in the name of the tribe, or location. The Damaras, living in German South West Africa, are not the most northerly but rather the most southerly tribe on the west coast, practising the custom.

Schlagintweit says: "In Liberia (43) the custom of filing is in use and both the superior and inferior incisors are affected. They file them to a sharp point."

Along the Loango coast they are either knocked out or filed with a triangle on the mesial aspect, and continues: A prince cannot marry without having his teeth filed and when this occurs a feast takes place to insure the health of the teeth. The Mus-sorongi break the incisors out, and in the kingdom of Umdingi the natives have the anterior teeth filed to a point, outwards. The Wanjamari, Nile delta, remove the lower incisors and file the superior ones in such a fashion as to make a V-shaped space. In Unyoro, the inferior incisors are removed and no Myoro native will allow anyone to drink out of his cup if his teeth are not treated in his fashion. In Usogo is the same custom. The natives on the Nile, Lat. 5 degrees N., pull out their lower teeth so as not to resemble an ass. The Latukas of the Nile district remove their four inferior incisors. The Wanika, living near Mombasa, east coast, file between their superior incisors, but in such a fashion as to create a deep cut.

Among the Wapakomo, Fischer (44) informs us, near the Tane River, the Father or the "doctor" removes the inferior deciduous centrals of the children, and in order to prevent the permanent incisors from taking their place, a red hot knife is inserted to destroy the tissues surrounding the erupting tooth, and so to destroy this element also. This seems to be the only instance, so far as the writer is aware of, where the above practice prevails.

Livingstone (45), the greatest of explorers, mentions several tribes accustomed to mutilate their teeth. The Makonde and Matambwe file their anterior teeth, while the Mashinga extract an inferior and superior central incisor, the lateral incisors being filed to a point. The Bolunga, living in Wrungu, remove one or two inferior incisors. Both the men and women do this. The Matumboka, belonging to the Manganja, file their teeth to a point and so do the Babisa. Other Manganja cut into the superior incisors, sometimes making pointed holes, other times round ones. The work is accomplished with small pieces of quartz stones.

The Makalalos knock out, among both men and women, two of their superior incisors. Hildebrandt (46), who traveled through Africa in 1874, told Von Jhering that on the east coast the Marambo file to a point their superior incisors, the M'Tschingoli the superior and inferior and the M'Tschanja the four superior and inferior with a deep cut across the buccal surface. Turner (47) describes a skull of a Manganja which showed a most peculiar mode of mutilation by cutting into the incisal edge of the superior incisors, resulting in a large central pointed eminence and two smaller ones. These Manganjas are also known as Wanyassa.

The Barotse in Northern Rhodesia and along the middle Zambesi remove their superior centrals. The Moviza or Muiza file their incisors to one sharp point, and so do the Wakamba, who seem to be the most northerly tribe on the east coast to practise this custom. The Bedsha, north of Abyssinia, in olden times, seem to have had the custom, but it is not practised today. These people probably took over this custom from their southern negro neighbors, with whom they intermarried a great deal.

Fritsch (48) tells us that the Damara and Orva-Herero during initiation knock out the inferior incisors and file the superiors to a sharp point. The same is done for the girls reaching puberty. Their speech assumes a lisping character. The Orva-Herero do the same.

Summary

Exhibit A was drawn up to enable the reader to obtain a rapid and complete survey of the subject matter. There is such a bulk of material, justifying the reader in taking the writer's word for it and saying no more. The alphabetical arrangement allows him to look for any one of the tribes mentioned to get the desired information. Exhibit B was arranged to enable the reader to ascertain where one particular custom prevails. The maps, with the different colonies, protectorates, lakes and rivers, were drawn in order to get a picture of the geographical distribution, showing where the several customs occur, this being accomplished by the shading method. There are several places where the various shades overlap each other, which necessitated the drawing of two maps.

The shaded areas are more or less arbitrary on account of not having the exact location of the various tribes, and also because of the scattering of some of them. On the whole, the record can be considered as accurate as the circumstances allow it to be.

It is fairly safe to say that the custom of teeth mutilation is primarily centered in middle Africa, not having been recorded south of the Zambesi River on the east coast, and but twice south of the Congo, once in Portuguese and once in German West Africa.

The Wadai is the most northerly, the Damara the most southerly tribe practising teeth mutilations. Whether the influence of the northern invaders or that of the southern settlers has any bearing on the absence of such customs in both Northern and Southern Africa could not be established, although the evidence points to it. Neither the wide, outstretched fields of Southern Africa nor the deserts of the north lend themselves very easily to superstitions which seem to flourish more easily where there is a greater abundance of game, water, timber, etc., making subsistence comparatively easy. Thus there is more time for pleasures and pastimes, and also for beautifying the body, either by tattooing or teeth mutilation. Still another factor may be the primeval forests, with their dark nights and secluded spots, which are apt to stimulate the savage mind to revere the supernatural powers.

We read in these days many books on Africa, most of which contain the impressions of travelers passing through on short visits. Their opinions are often the result of information hastily gleaned from others, and are in many cases quite unreliable. In order really to appreciate the habits and customs of the natives one must live in their country and speak their language. The native abhors questions by a traveler about his private life, and one must wait with patience for the opportune moment to extract from him the desired information. I say this on account of having quoted so many travelers, some of whom may have had an abundance of imagination which may involve the validity of the subject matter exhibited in the previous pages. A good example of different observations about the same thing is demon-

X

Four modes of tooth filing. 1, Makua. 2 and 4, Yao. 3, Anyika and other tribes.

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strated in the reading of references ten and eleven, where the difference is particularly apparent.

On the whole, I can say that the natives in their own state of society have good teeth and take a certain amount of care in keeping them clean. They go to the river and wash their mouths, often using their fingers to remove the excessive food deposits, and some of them using a piece of twig chewed on one end so as to make a brush. This state of affairs changes, however, when they are brought to work for the white man and especially in places where they are gathered by thousands in a small compound, as in the gold and diamond regions. Here I clearly observed natives with teeth in a very bad state. It seems that our western civilization creates a sort of "I don't care" attitude on the part of the native, not only relative to our subject, but also in regard to his morals and personal conduct.

As a general rule, it may be said that so-called "surgery," under which head teeth extraction also assigns itself, and "medicine," are not practised by one and the same person. Surgery, etc., is the result of any particular native's ability to cope with a certain situation involving manual dexterity, and having been successful once he will be called again for the same procedure to be performed upon another member of the tribe. Medicine, on the other hand, seems to be a caste, the secrets of which are passed from relative to relative and as a whole is much higher in esteem than surgery. The very secrecy places this "medical art" far above the comprehension of the ordinary native's mind.

The African natives are easy victims of circumstances and surroundings, changing in a short time customs handed down by untold generations. This, to my mind, is caused by inherent laziness and the fact that they do things simply from habit and because others do them. This trait sometimes creates very funny adaptations, a few of which were seen when visiting some of the Kaffir compounds, but I will not take time to describe this phase of the matter.

I am, however, convinced that some of the "tooth-knocking-out" customs and filing of teeth have been bodily taken over by different tribes, to which may be added that most of them

can give no reasons at all for the custom, while others ascribe princely honors to it. Therefore, while but three references have been made regarding the possibility of filing being of cannibal origin, I am nevertheless of the opinion that these two were once associated, although no proof of this opinion can be brought forward, and I could safely advance the theory that mutilations are practised for reasons of adornment only. I would here like to call the reader's attention to some modes of filing which are no aid at all to the eating of meat, either raw or roasted. Certainly the filing practised by the Loango-Coast tribes, by the M'Tschanja tribe of the East Coast, the Wanika of the British Protectorate, and the Nanganja of Nyasaland do not add to the cannibal hypothesis, but these again may be recent adaptations from one original custom. There has been too little attention paid by explorers to these customs and their origin, which makes any intelligent discussion at present very speculative to say the least.

Some writers contend that the filing did not seem to affect the life of the teeth involved. These contentions I must disqualify, first because of dental experience, and secondly, on account of personal observation of natives who practised the habit. I have seen a great many who once had their teeth filed, who lost them without being able to tell the reason why, but which explains itself when once we consider the results of removing the enamel and exposing the dentin.

The methods employed in filing and chipping do not differ to an extent warranting any attempt of classification. My personal inquiries disclosed the fact that some tribes first chip their teeth, after which filing with small selected stones is resorted to. Every one speaks of filing the teeth, but very few ever mention the method employed. Chipping is much the quicker and in the long run less painful, although each particular blow must mean a good deal of suffering.

After the teeth are once shaped to a point, the subject in question seems from time to time to file them in order to keep them so. This conclusion is based on the evidence that the older the subject is, the smaller his mutilated teeth are, although they are still very pointed. It seems that when the tip fractures the

process is begun over again. When the interpreter asked the natives about it, they could not keep from laughing, closing their mouths in the meantime and moving away, much amused at our persistent inquiry. The result was that nothing definite from them could be obtained regarding the above conclusion.

The several methods of "extraction" have been illustrated and need no further comment, though the most prevalent one seems to be by means of stone and stick.

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EXHIBIT A—I

Name of Tribe	Location	Mode of Filing	Teeth Affected	Filing Superior	Filing Inferior	Extraction	Age	Sex	Reasons for Procedures and Remarks
Agawa.....	?	pointed	Sup. and Inf. Incisors	yes	yes	no	?	?	Unknown.
Akela.....	Congo	none	All incisors	no	no	yes	adult	male	Is considered fashionable.
Amatonga.....	Delagoa Bay	pointed	Sup. plus Inf. Incisors	yes	yes	no	?	?	Unknown.
Ammini.....	Congo Basin	pointed	All incisors	yes	yes	no	adults	both	Unknown.
Anyika.....	Nyassa Land	mesial-incisal	Sup. Central Incisors	yes	no	no	?	?	Unknown.
Apone.....	Equato Lateral Africa	pointed	Sup. Lat. Incisors plus Inf. Incisors	yes	yes	Superior Centrals	..	..	Unknown.
Babira.....	Uganda	pointed	Sup. Incisors ÷ Cuspids	yes	no	no	child-hood	both	Unknown.
Babisa.....	Northern Rhodesia	pointed	All Incisors	yes	yes	no	adults	both	Unknown.
Bagenda.....	Upper part of Congo	none	Temporary teeth	no	no	yes	child-hood	both	Done by child upon request of father. Beginning of Orthodontia in a primitive race.
Bai.....	Baghirni	none	Sup. Incisors	no	no	yes	?	both	Unknown.
Bakongo.....	Lower Congo River	pointed	Sup. and Inf. Centrals	yes	yes	no	adults	both	Unknown.
Bakusu.....	Congo Basin	pointed	All Incisors	yes	yes	no	adults	both	Unknown.
Baloi.....	Congo	none	4 Sup. Incisors	no	no	yes	adults	both	Unknown.
Batimba.....	River Welle, Northern Congo	pointed	Sup. Incisors ÷ Cuspids	yes	no	no	adults	both	Unknown.
Bangola.....	Congo Basin	pointed	All Incisors	yes	yes	no	adults	both	Unknown.
Barotea.....	Northern Rhodesia	none	Sup. Central Incisors	no	no	yes	adults	?	Unknown.
Basenga.....	Left Bank of Zambesi River, long. 31° E.	pointed	Sup. Incisors ÷ Cuspids	yes	no	no	?	?	Unknown.
Basonga.....	Congo Basin	pointed	All Incisors	yes	yes	no	adults	both	Unknown.
Basongomeno.....	Congo Basin	pointed	All Incisors	yes	yes	no	adults	both	Unknown.
Batonga or Batoka	Middle Zambesi River, long. 28° E.	none	Sup. Incisors and Cuspids	no	no	yes	?	both	To be like oxen.

Bayaka.....	Congo	pointed	All Incisors	yes	yes	yes	adults	both	Sometimes knock out a couple of incisors instead of filing.
Bedaha.....	North of Abyssinia	?	?	?	?	?	?	?	Had a custom of filing in olden times but is not in vogue now.
Benda or Banta.....	West Coast Africa	?	Sup. Incisors	yes	no	no	?	male	Unknown.
Bolunga.....	Wrungu	none	1 or 2 Inf. Incisors	no	no	yes	adults	both	Unknown.
Bongo.....	Upper Nile, lat. 7° N.	mesial-triangular	Superior Incisors	yes	no	yes, Inf. Incisors	..	..	Unknown.
Bopoto.....	Northern Congo	pointed	Sup. incisors ÷ Cuspids	yes	no	no	child-hood	both	Not definitely known. Probable cannibal origin, now only a custom.
Bullamer.....	Western part of Waday	?	?	?	?	no	?	?	The filing of the anterior teeth is in vogue, but not a general custom.
Damara.....	German So. West Africa	pointed	Sup. + Inf. Incisors	yes	no	yes	at puberty	both	This is done during initiation.
Dinka.....	Sudan	?	One Inf. Incisor	no	no	yes	at puberty	both	Never touch the temporary dentition.
Fams or Famine.....	Equato Lat. Africa	?	All Inc. ÷ Cuspids, Inf. Incisors	yes	yes	no	at puberty	male	Only the king practises this custom, after which teeth are stained black.
Ha-luo or Luo or Shillook..	Left Bank White Nile, lat. 7° N.	none	Unknown	no	no	yes	adults	both	Unknown.
Jiang.....	Bahr-el-Ghazal	none	Inf. Incisors ÷ Cuspids	no	no	yes	adults	both	Unknown.
Kavirondo.....	West from Lake Victoria Nyanza	none	Inf. Central Incisors	no	no	yes	?	both	To avoid to be killed in war.
Lango Tribes.....	East of Lake Albert Nyanza	none	Inf. Incisors ÷ Cuspids	no	no	yes	boys and girls	both	Unknown.
Latuka.....	Nile District	none	4 Inf. Incisors	no	no	yes	?	?	Unknown.
Machoppee.....	Mosambique	pointed	Sup. + Inf. Incisors ÷ Cuspids	yes	yes	no	adults	both	Were unable to explain reasons for filing. Now mere custom.
Makalalos.....	South of Lake Nyassa	none	Sup. Incisors	no	no	yes	adults	both	Unknown.
Makonde.....	Southern German East Africa	?	All Incisors	yes	yes	no	?	both	Unknown.

EXHIBIT A-II

Name of Tribe	Location	Mode of Filing	Teeth Affected	Filing Superior	Filing Inferior	Extraction	Age	Sex	Reasons for Procedures and Remarks
Makua.....	N. E. Portuguese East Africa	pointed	Sup. Incisors and Cuspids	yes	no	no	boys	male	Unknown.
Mambroe.....	Nyassa Tanganyika Plateau	none	Inf. Central Incisors	no	no	yes	15 years	both	Unknown.
Manganga or Wanyassa.....	South of Lake Nyassa	serrated	Sup. Central Incisors	yes	no	no	adults	?	Showing one large prominent eminence and two smaller ones.
Manganja.....	Nyassa Land	mesial-triangular	2 Sup. Centrals	yes	no	no	adults	both	Unknown.
Manyema.....	Congo Basin	pointed	All Incisors	yes	yes	no	adults	both	Unknown.
Marambo.....	East Coast	pointed	Sup. Incisors	yes	no	no	adults	both	Unknown.
Masai.....	West from Lake Victoria Nyansa	none	Inf. Central Incisors	no	no	yes	?	both	A probable measure to prevent starvation from lockjaw, but now a more custom. The spitting habit very improbable.
Mashinga or Bashenge.....	Congo	?	File all teeth except one Sup. and one Inf. Central	yes	yes	yes	?	?	Extract only one Sup. Central and one Inf. Central.
Matambwe.....	Portuguese East Africa	?	All Incisors	yes	yes	no	?	both	Unknown.
Matumboka.....	West Shore, Lake Nyassa	pointed	All Incisors	yes	yes	no	adults	both	Unknown.
Matunboko.....	West of Lake Nyassa	pointed	Sup. + Inf. Incisors	yes	yes	no	adults	both	Unknown.
Mi-Leanga.....	Congo	pointed	All Incisors	yes	yes	no	boys	male	An expression of beauty.
Mongonga.....	?	pointed	Sup. + Inf. Incisors	yes	yes	no	?	?	Unknown.
Movisa or Muiza.....	North East Coast	pointed	Sup. + Inf. Incisors	yes	yes	no	adults	?	Unknown.
M. Tachingoli.....	East Coast	pointed	Sup. + Inf. Incisors	yes	yes	no	adults	both	Unknown.
M. Tchanja.....	East Coast	Buccal relief filing	Sup. and Inf. Incisors	yes	yes	no	adults	both	A deep cut across the buccal surface.
Musorongi.....	Umdingi Kingdom	none	?	yes	no	no	?	?	The teeth are broken off at the gingiva.

Myoro.....	?	none	4 Inf. Incisors	no	no	yes	?	?	So as not to resemble an ass; and another states, no one will allow any other person to drink out of his cup unless his teeth are attended to.
?	Usogo	none	4 Inf. Incisors	no	no	yes	?	?	Unknown.
?	Unyoro	none	4 Inf. Incisors	no	no	yes	?	?	Unknown.
Nanna or Nano or Banano..	Portuguese West Africa	none	Inferior Centrals	no	no	yes	?	?	The medicine men and the chief have the two superior incisors removed.
Ngombe.....	Congo Basin	pointed	All Incisors	yes	yes	no	adults	both	Unknown.
Niam-Niam.....	Central Africa	pointed	Sup. + Inf. Incisors + Cuspids	yes	yes	no	at puberty	male	To be allowed to become a warrior.
Nyanga.....	Nigeria	pointed	All Incisors and Cuspids	yes	yes	no	adults	both	Associated with cannibal rites, according to author 28.
Nyanga.....	Congo	pointed	All Incisors	yes	yes	no	?	?	Unknown.
Okaunde.....	Baghirmi	?	Sup. Incisors	yes	no	no	?	male	Unknown.
Ova-Herero.....	German West Africa	pointed	Inf. Incisors knocked out; Sup. are filed	yes	no	yes	at puberty	both	Done during initiation.
Orva-Herero.....	German West Africa	pointed	Inf. Incisors knocked out; Sup. are filed	yes	no	yes	at puberty	both	Done during initiation.
Otando.....	Equato Lateral Africa	pointed	Sup. + Inf. Incisors	yes	yes	no	?	both	Unknown.
Pygmies.....	Central Africa	pointed	Sup. Centrals + Cuspids	yes	no	no	?	?	Unknown.
Pygmies.....	Congo River	pointed	All Incisors	yes	yes	no	adults	both	To tear raw meat ? according to author 27.
Sara.....	Baghirmi	none	2 Sup. Centrals	no	no	yes	?	both	Unknown.
Shilluk.....	Upper Nile Delta	mesial-triangular	Inf. Incisors + Cuspids	no	yes	no	?	?	Unknown.
Somrai.....	Baghirmi	none	1 Sup. Incisor	no	no	yes	?	both	Unknown.
Taüta.....	Province Unkami	pointed	Sup. + Inf. Incisors + Cuspids	yes	yes	no	?	?	Unknown.

EXHIBIT A—III

Name of Tribe	Location	Mode of Filing	Teeth Affected	Filing Superior	Filing Inferior	Extraction	Age	Sex	Reasons for Procedures and Remarks
Tamaneer or Temne.....	Sierra-Leone Coast	?	?	?	?	?	?	?	Unknown.
Tribes.....	Sierra-Leone Coast	?	Sup. + Inf. Incisors	yes	yes	no	at marriage	female	Is done before marriage in presence of bridegroom, after which their union is made holy.
Tshagoo.	?	pointed	Sup. + Inf. Incisors	yes	yes	no	?	both	Unknown.
Turkoma.	Uganda	none	One inf. Incisor	no	no	yes	?	?	Unknown.
Wa-Kikuyu.....	British Protectorate.....	pointed	Sup. + Inf. Incisors	yes	yes	no	adults	both	Unknown.
Wa-Taita	East African Protectorate	pointed	Sup. + Inf. Incisors	yes	yes	no	?	?	Unknown.
Wachaga or Wacago.....	German East Africa	none	Inf. Incisors	no	no	yes	?	?	Unknown.
Wadama.	Northern Kamerun	pointed	Incisors ?	yes	yes	no	?	?	Custom is disappearing and seldom practised now.
Wakambi-	Wakambi Coast	pointed	All Incisors	yes	yes	no	adults	both	Unknown.
Wakamb	ami	pointed	Sup. + Inf. Incisors + Canines	yes	yes	no	?	?	Unknown.
Wandai	?	none	Inf. Central Incisors	no	no	yes	boys and girls	both	Unknown.
Wanjams		mesial-incisal	Sup. Incisors	yes	no	yes			
Wanka	torato	mesial-triangular	Sup. Central Incisors	yes	no	no	adults	both	Custom is disappearing and seldom practised now.
Wapali o	Africa	none	Inf. Incisors	no	no	yes	?	?	Unknown.
Wapulus	ritish East Africa	none	Inf. Centrals	no	no	yes	children	both	They remove temporary elements, and destroy the permanent ones with a hot wire.
Yao or Y	Nyasas	serrated	Sup. Incisors	yes	no	no	at 15 years	both	Unknown

Map No. I

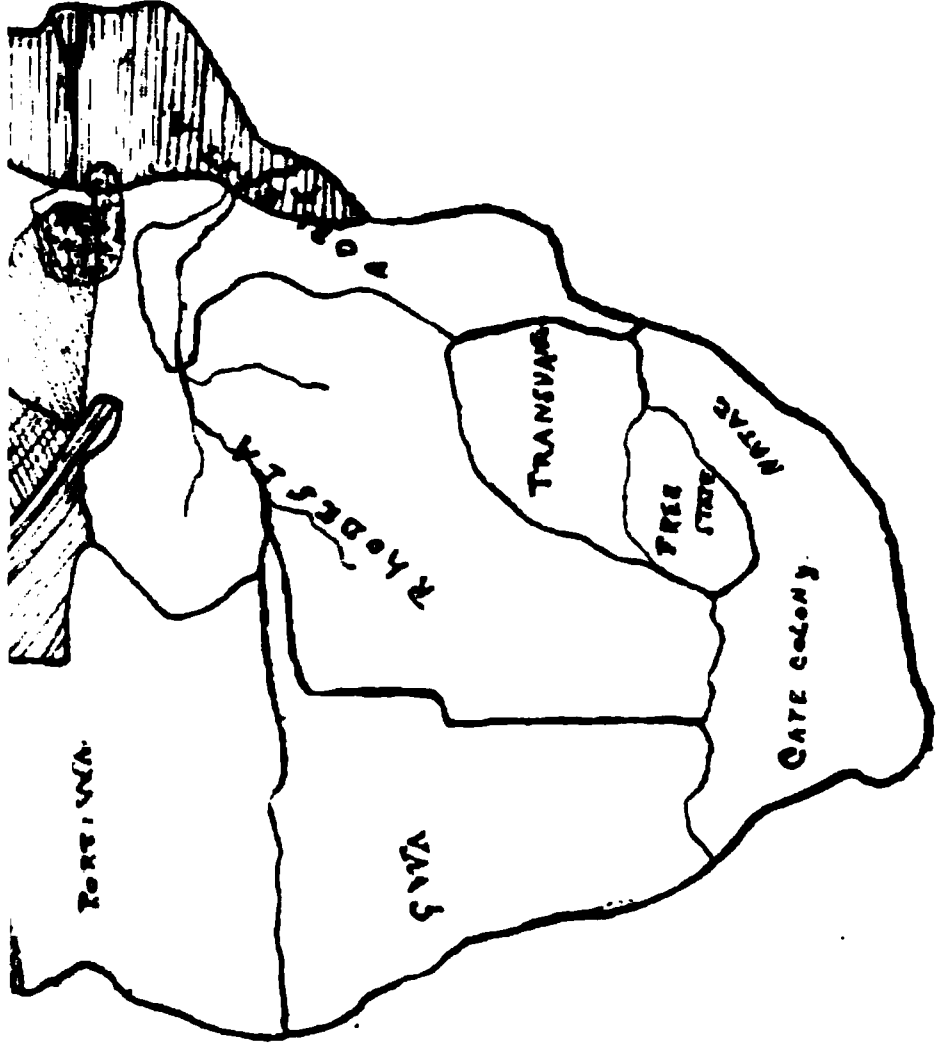


EXHIBIT B (I)

GROUP I—Superior and inferior pointed filing, mesial and distal

Nigeria

Lower Congo River

Congo Basin

Northern Kamerun

West Shore Lake Nyassa

Northwest Rhodesia

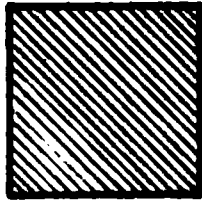
North East Coast

West Equato Lateral Africa

South of 'Ogowai River

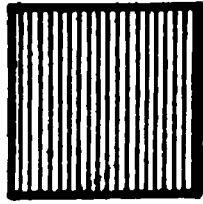
French Congo Coast

Sierra Leone



Congo
Pygmies Congo

GROUP II—Superior pointed filing alone



Northern Congo

French Congo Coast Ogowai River

Southwest of Lake Nyassa

Northeast Portuguese East Africa

Left Bank Zambesi River

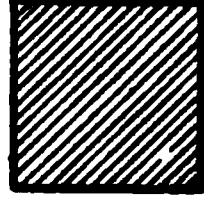
Uganda

River Welle—Northern Congo

Central Africa

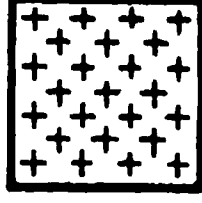
GROUP III—Inferior pointed filing alone
None

GROUP IV—Superior and inferior filing and extraction



Congo. Two races

GROUP VII—Filing to a serrate form



South of Lake Nyassa
East of Lake Nyassa

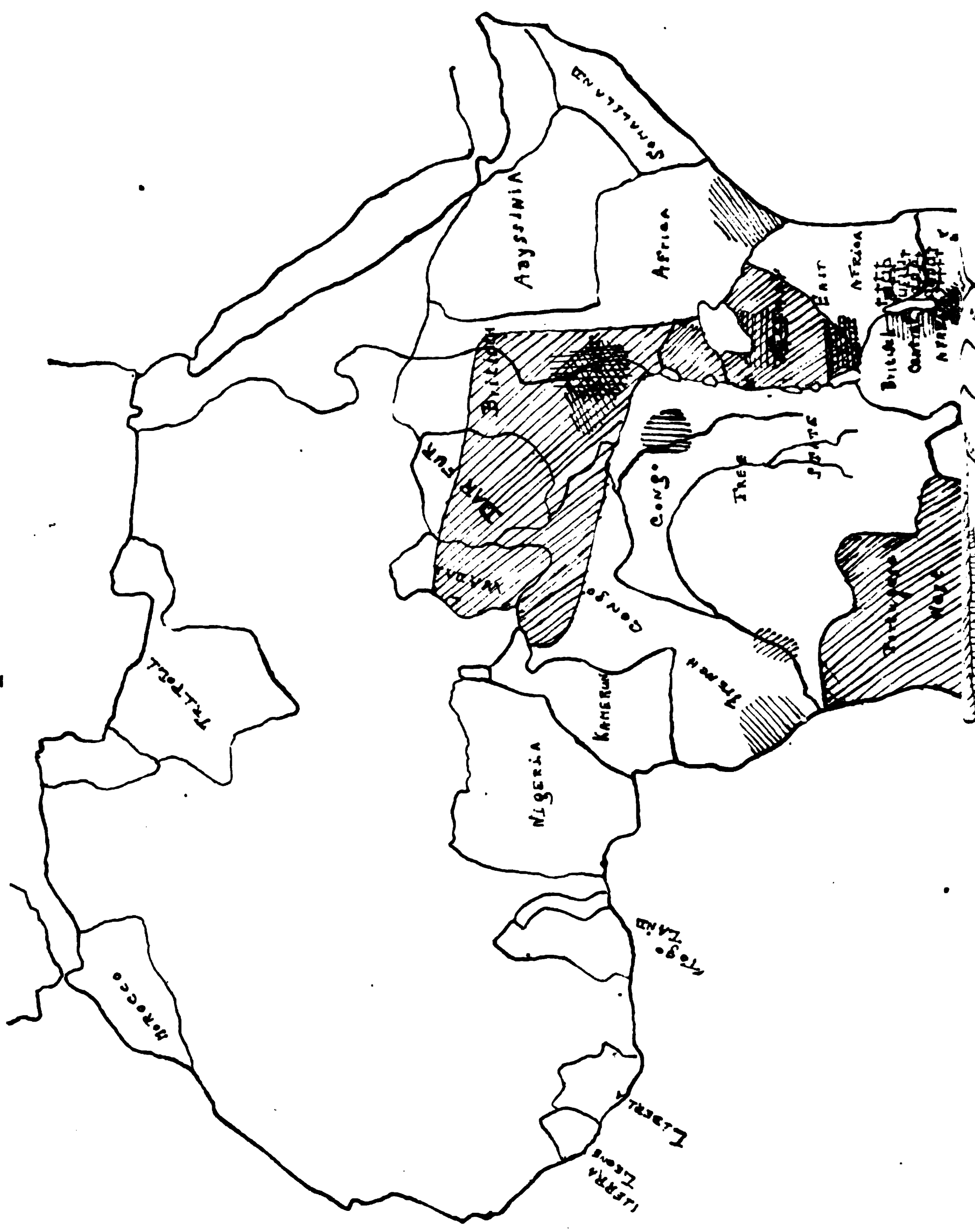


EXHIBIT B (II)

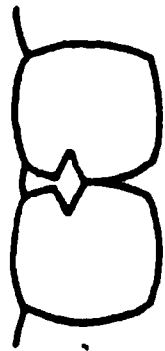
GROUP V—Superior pointed filing and extraction.



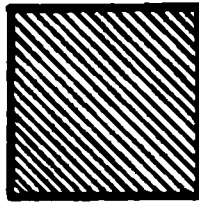
German West—Damara
Orva-Herero
Upper Nile
North of the Lower Congo River

GROUP VI—Inferior pointed filing and extraction
None

GROUP VIII—Gingival-medial triangle filing



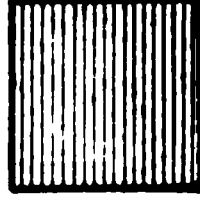
Loango Coast French Congo
Upper Nile Southern Kordufan
Nyasaland South of Lake Nyassa
British East Africa Southeast Coast
Region of Bahr-el-Ghazal



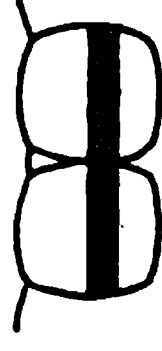
GROUP IX—Superior mesial incisal filing



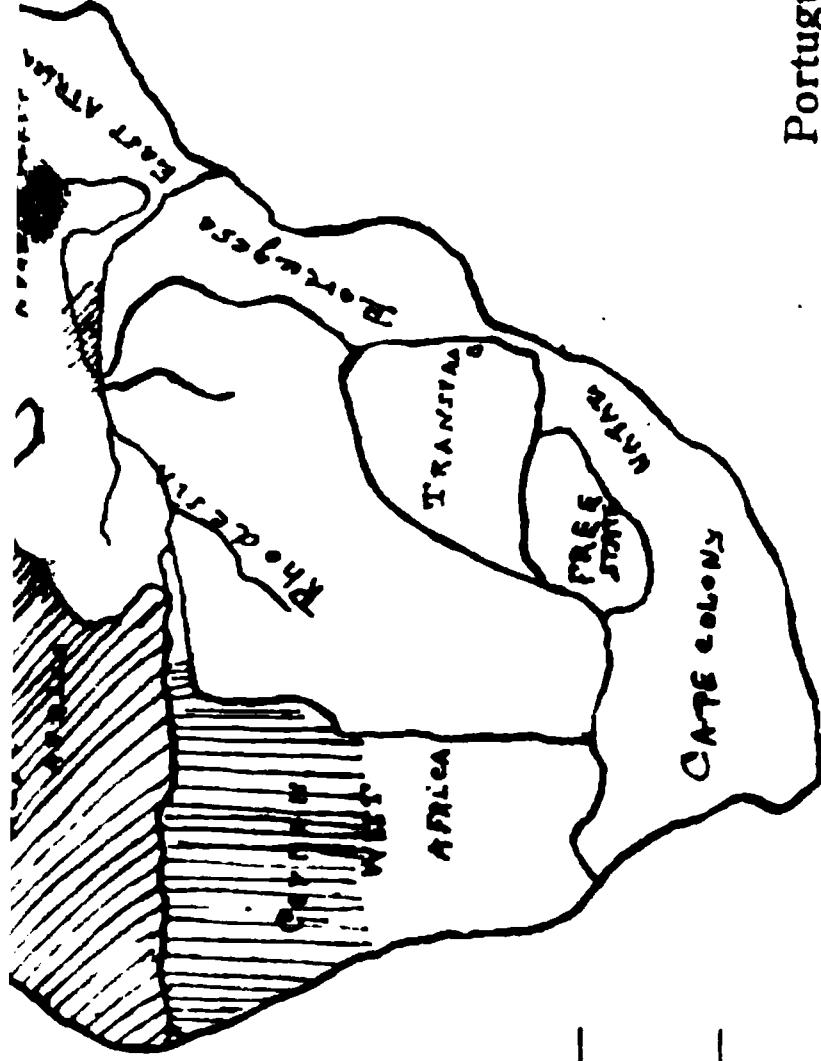
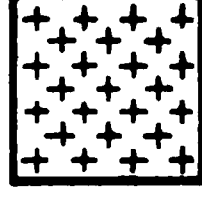
East of Lake Tanganyika
Nyassa Land South of Lake Vic-
toria
Nyanza



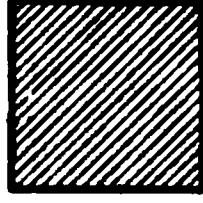
GROUP X—Superior buccal horizontal relief filing



East of Lake Nyassa



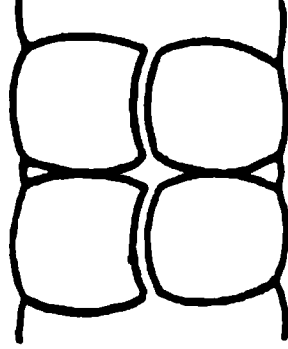
GROUP XI—Extraction only



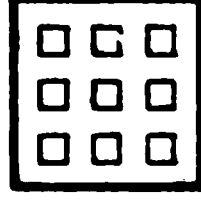
Tane River Southern British East
Africa
Uganda
Northern Congo
Usogo North of Lake Victoria
Nyanza
Unyoro
Upper Nile District
Portuguese West Africa

Portuguese: West Africa
Nyasa-Tanganyika Plateau
Middle Zambesi River
Sudan (Dinka)
German East Africa (Kilima-
Njaro)
Wandai in Wadai
Bahr-el Ghazal
Left Bank White Nile
East of Lake Albert Nyanza
East and West and South of Ki-
lima-Njaro German East Africa
South of Lake Tanganyika
Umdingi Kingdom Lower Congo
River
South of Lake Nyassa
Gaghirmi Kingdom East to North-
ern Kamerun

GROUP XII—Superior concave and inferior convex filing



East of Lake Nyassa



A SIMPLE FORM OF REMOVABLE BRIDGE WITH CAST CLASPS¹

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THE bridge about to be described is a type adapted to fill spaces caused by the loss of *bicuspid*s and *molars* in either jaw. I make no claim that it can be used *everywhere* in the mouth to supply missing teeth. In fact, I believe no single system of bridgework is universal, despite the claims of its advocates.

This bridge, then, is a modified form of the old Bonwill bridge, using two stop clasps, better known to-day as lug clasps. Dr. Prothero in his late work on Prosthetic Dentistry says (1) "Without doubt this form of clasp, or some modification of it, in which the stop principle is embodied, is the most satisfactory and serviceable of any of the common types of partial hand clasps. By the addition of the stop, frictional wear of the enamel is practically overcome, undue pressure on the alveolar process covered by the bridge and on the gingiva surrounding the tooth clasped is obviated, and a feeling of security and comfort to the wearer of the bridge results, which is not possible when the ordinary type of clasp is used. The credit of having evolved, demonstrated and described the practical applicability of the stop clasp should be ascribed to Dr. Bonwill."

The appliance I am describing in this paper is the result of experiments begun late in 1913 to supply a missing tooth in my lower jaw. After a number of spring clasp and wire attachments had failed, I succeeded in making a bridge with cast clasps that has been worn with comfort and efficiency for nearly four years.

That the dental profession was in much need of such an

¹ Part of three lectures given before Four-States Post Graduate Dental Meeting, New Orleans, Louisiana, June 4, 5, 6, 1917. Read before Harvard Odontological Society, Boston, Jan. 17, 1918.

appliance has been best evinced by the interest shown since I began my experiments and first exhibited some completed bridges.

The appliance has replaced, in many cases, pieces of fixed bridgework, and bent clasp appliances, and in nearly every instance, the patient has reported more comfort and efficiency in chewing food. And, after all, you must realize that the patient has the final word on this subject. In the case of my bridge I was the patient, so I *know*.

It has been my privilege during the three years I have been working out the technic of this bridge, to make them for several *dentists* to use in their own mouths; for the wives of several dentists and for the patients of about twenty-five different dentists. I consider the report of some 200 cases taken this way to be of more value than if they were all from one practice.

It has also proved conclusively that the indirect method used in making the bridge was successful, providing the steps were carried through correctly. I know this has been questioned quite a little since my first paper on this subject. But in every instance where the practitioner has taken a correct plaster impression and obtained a correct bite, the bridge has gone to place with little or no adjusting and has been useful from the first hour.

Indications for Use

Cases with both abutment teeth sound, with hard dense enamel, teeth usually badly tipped or out of line, or both; and with the dentist, and probably in these days, the patient, averse to devitalization, are ideal for this method. Just these cases are the ones most of us have sidestepped without any attempt to supply a tooth, because we were not satisfied with any of the known methods of supplying that tooth.

The next indication for use is in places where a fixed bridge has been used—say from first bicuspid to second molar—and like most fixed bridges, has begun slowly but surely to loosen the abutment teeth. The removal of the fixed bridge, placing of well filled caps on abutment teeth and substitution of a cast clasp bridge, will result in a tightening of the abutment teeth.

If one desires to use this type of bridge on small teeth, with thin chalky enamel, with many fillings in place, it is preferable

to make well fitted shell caps, and cement them to place before taking the impression for the bridge. The more the teeth are tipped, the more this type of work is indicated, as it is a comparatively easy matter to cap these teeth individually, and an entirely different matter to attempt the parallelism necessary for a fixed bridge.

A particularly fine piece of work may be done by casting the caps with recessed places to accommodate the clasps and lugs, so that when the clasp is placed upon the crown there is no break in the outline of the tooth.

Fixed vs. Removable Bridgework

Taking all points into consideration, a removable bridge is the only sane appliance to put into the human mouth. It is my conviction that a removable type of bridge should be employed *whenever possible*, and that a fixed bridge should be *used only* where it is impossible to construct a *satisfactory removable* one. That I am not alone in my belief would seem to be borne out by the fact that several well known dentists are wearing cast clasp bridges to replace one or more missing teeth. It is interesting to note that not one of these men was willing to have a fixed bridge constructed for two reasons: first, because it involved more or less mutilation of two perfectly sound teeth; and second, because of the great difficulty, I might say impossibility, of keeping the fixed bridge perfectly clean. If we are not willing to put fixed bridges in our *own* mouths, why should we be willing to put them in the mouths of our patients? The Golden Rule is just as effective today, my friends, as when it was first written.

If we are to accept the tenet that nature knew what she was about when she so placed our teeth that every one is free to move slightly when stress is placed on it, then we must believe that some form of removable bridgework is indicated. (3) "From a hygienic point of view there can be no question as to which is the best. It is impossible to thoroughly cleanse and sterilize any fixed bridge, as there is nothing which can be taken in the mouth that is of sufficient strength to perfectly cleanse and sterilize it without injury to the soft tissues."

Construction Technic

The construction, although simple, is not easy, and requires the utmost attention to detail and care in every step of the process. (3) "The value of removable bridgework, depends entirely upon the attention given to the numerous details and upon the *accuracy* with which the work is done. The fittings must be as nearly perfect as it is possible to make them, otherwise the work will not prove a success. The training which one gets in doing this class of work tends not only to make him more *proficient* in bridgework, but more proficient in every branch of the profession, as the care and skill required develops a delicacy of *touch* and *exactness* in manipulation to a greater degree than does the ordinary routine of the dental work-room."

Preparation of Teeth and Impressions

The abutment teeth to be clasped are cleaned and polished, and the occlusion noted, for space must be provided for the stops or lugs at *this time*, if it does not exist. Deep grinding is not necessary and is to be deplored as it leads to rapid decay.

Next, an accurate plaster impression is taken, and this is the keynote of the whole process, for these clasps have practically an inlay fit, and *under no circumstances should attempts* be made to correct any error in fit, by bending.

A small swivel crown and bridge tray is oiled and the impression plaster mixed much thinner than for other impression work, for sharpness and definition must be obtained in all our tooth lines, and the stiffer mix of plaster will not flow into undercuts caused by tipped or leaning teeth. When the plaster has *started* to set, the tray is removed and the plaster scored at suitable points so that it can be removed in sections. Then it is allowed to complete its setting, to a point where it will break with a clean sharp fracture. The resulting sections are next removed, taking care to preserve all small, but possibly important fragments.

The impression plaster used is French's as it is a standard plaster and runs fairly uniform. For such a thin mix a *hastener* is necessary, and I prefer a saturated solution of potassium sulphate.

The proportions are as follows:

2 F drams or dessertspoonful Pot. Sul. to

6 F drams or 3 dessertspoonfuls water.

Add plaster as fast as possible with only enough stirring to avoid lumps. This mix gives but 10 seconds working time for placing in tray and getting to place in the mouth, so one cannot travel all over the office with it before getting it to place. The oiled tray can be removed in 20 seconds, plaster scored in one minute and broken and removed in two minutes. The consistency of a plaster mix made in this manner should be as thin as will stick in an inverted tray. It takes every sharp line and holds it without "mushing," sets promptly and rapidly enough so that it can usually be removed before any great amount of saliva collects in the patient's mouth—a great advantage. It does not make a *strong* mix, but that is *not desired*, as such a mix *breaks out with too much difficulty*. A *prompt firm setting* without *great strength* is what is desired. Plaster is by no means easy to use, and several impressions must be taken in some cases having long tipping teeth, before one accurate enough to be used can be obtained. Under no circumstances should a poor or incomplete impression be used with the idea of correcting the defects in the model by carving, as failure or only partial success will surely result.

Next, a modelling compound impression of the opposing teeth, a small guide bite in wax and shade of teeth are taken. If this data is accurately obtained, the patient need not be seen again until the bridge is ready. The plaster impression should be put together as soon as fairly dry, using the tray for a matrix or guide for the proper position of the pieces. Personally, I find it almost impossible to get the pieces in their proper places, without some slight distortion, unless I place them in the tray, and secure them with sticky wax. The impression should be coated lightly with shellac, followed after it is dry by sandarac varnish, being careful not to use either coating too thick. When the last coat of sandarac is thoroughly dry, the impressions of the two teeth that are to be clasped are packed with amalgam, small tapered metal dowels of rectangular cross section being first sunk in the amalgam before it has begun to set. Care should be

taken to shape and smooth these dowels so that they will draw easily, and to set them as nearly parallel as possible so that both teeth, no matter how badly tipped, can be removed in the same plane.

After the amalgam has set hard enough so that the dowels are firm, they are *oiled* and the balance of the impression packed with Weinstein's Artificial Stone. Plaster can be used for this part, but the artificial stone gives a more satisfactory working surface.. This new material, a calcium barium-silicate, is an almost invaluable material for the crown and bridge worker. Models made from it are remarkably hard and durable, and it possesses practically no expansion or contraction.

The compound impression is next poured and the two resulting models are mounted on an anatomical crown and bridge articulator, the wax guide bite being used to establish occlusal relations.

We now have a working model, correctly articulated, with two removable amalgam teeth, which have their dowel pins in the same plane so that both teeth can be removed freely.

The clasps are next outlined with pencil on the amalgam teeth and waxed up for casting as follows: A piece of thin sheet casting wax (No. 28 gauge) is warmed and adapted very closely to the *entire surface* of the tooth, which has been previously slightly oiled, *only between the lines marking the clasp outline*. The sheet wax used is either Solbrig's, which is an English product and rather hard to obtain, or Kerr's. The latter is a recent American product, and meets all requirements. This wax matrix is then re-enforced by flowing on Taggart's Green casting wax to the desired thickness, which of course varies with the case. The pencil outline previously marked on the tooth can be seen through the covering of pink wax and serves as a guide, both for waxing up and subsequent trimming. After sufficient Taggart wax has been added and smoothed up, the tooth is chilled in ice water, and the pink wax trimmed away to the desired outline of the clasp. A sprue wire is next attached, the wax again chilled in water and removed from the amalgam tooth. This has to be done with great care so as not to distort the wax pattern. With a little patience, it can usually be ac-

complished, and, if the waxing has been done accurately, and the wax pattern kept chilled, the two ends of the wax clasp will be seen to spring back to position as the clasp passes over the slight bulge of the tooth. If the wax opens up and does not spring back to position, or if it is badly distorted in removal, do not attempt to place it back on the tooth, but wax up another. Any attempt at patching a wax clasp pattern, or placing it back on the model after once removed always results in a too loose fitting clasp.

Casting Technic

Unless a technician understands a few fundamental principles as applied to dental metal casting, he cannot hope for much success in casting clasps. I speak of this because many batches of the casting metal have been returned to the dealers as "scrap," because the dentist purchasing it did not understand the first principles of casting. I have used somewhat over fourteen ounces of casting gold known as the "E" formula, both experimentally and in practical cases, and have never turned back a grain to the dealers except in the form of fillings and grindings. As a believer in the superiority of the Taggart process and the Taggart casting machine, I use an *expanding* inlay investment and cast in a cold mould, using *low* pressures for casting. Following is my casting technic, used for both inlay and clasp casting. All work is done at as near room temperature as possible. I have found but few reliable expanding *inlay* investments on the market, so my choice is either Taggart's or Weinstein's formula. All investments are mixed in definite proportions by the use of a weighing device, and the wax pattern invested as *soon* as *possible* after it is *removed* from the *model*, to guard against possible distortion. Sprue sizes used are generally 16 or 18 gauge (B. & S.).

Just as soon as the "initial set" of the plaster in the investment has taken place, the sprue wire is removed, and the flask placed over a low heat to dry out. *In no instance* where an *accurate* fit is desired, is the flask allowed to remain for longer than an hour before the drying out process is commenced. (4)
"It is hard to determine the actual principle involved, and it is

not important to do so, but the fact does exist that castings made in a green mould, or one that is not allowed to air dry, are more accurate than those made in an air dried mould." In addition, under such conditions—air drying—the investment is very apt to crack or split upon heating (Cause of "fins" on casting). Preparing a mould for casting should be done very carefully—as is usually *not* the case.

(4) "The initial stages of the heating should be at a temperature that will not permit the wax to run out of the mould, as it is important that the wax be absorbed in the mould. Forced heating and a generation of too much steam during the initial stages of the drying process, will force the wax out of the sprue hole and produce a rough interior, which in turn will show its effects upon the casting; the resultant casting being rough, incorrect and usually unfit for use." After all moisture has been driven off, the wax is burned out as quickly as possible without overheating the investment which never is brought up to red heat, the fact being borne in mind that plaster decomposes and disintegrates at a temperature around 375° F.

(4) "Prolonged heating of the investment after the wax has burned out is even more dangerous than under-heating, as plaster of Paris, which is the hinder, *shrinks in proportion to the time that it is exposed to heat.*" I have repeatedly dried and burned out a Taggart mould in twenty minutes, although from thirty to forty-five minutes is the usual time consumed. The flask is then allowed to cool, so that it can be carried to the casting machine in the hand. For the average size inlay or clasp, from 3 to 3½ dwt. of metal are used, and great care is taken not to overheat the metal.

(4) "While the ordinary gas and air blow-pipe is capable of producing temperatures only somewhat beyond 2400° F. it is possible to obtain without difficulty 3400° to 3500° F. from nitrous oxid and illuminating gas, and over 4000° F. from pure oxygen and illuminating gas." "It is very difficult to avoid super-heating gold, when applying such extreme temperatures and great caution must be exercised by the operator." "As a rule the cold flask is indicated when using extreme temperatures for melting the gold, because the gold melts very rapidly (15

to 20 seconds) and comparatively little heat is transmitted to the mould. The mold is then comparatively cool at the moment of casting, and even if somewhat super-heated gold is cast, it is not so apt to unite with the investment as when both the gold and the mould are super-heated."

(5) "It has been observed that when metals are cast at *too high* a temperature or are allowed to cool *too slowly*, that the resulting crystals are of large formation, resulting in a weaker casting. This tendency in steel casting is known as "myotism." Casting in a cold flask is of great importance in clasp casting, as it cools the molten metal very rapidly, which, as we have observed in the case of steel castings, results in a casting of greater density, strength and resiliency.

The casting pressures used range from $2\frac{1}{2}$ lbs. for a small inlay, to 10 lbs. for a large one where two or more pins are "picked up." About five pounds is used for casting most clasps.

(4) "One of the most prolific causes, in fact, perhaps the *greatest* cause that is productive of faulty castings, is the excessive pressure used in forcing metal into the mould. The principal reason for this is due to the fact that in a majority of casting apparatus there is no provision for obtaining a definitely measured and indicated amount of force. It takes just so much and no more pressure to force gold into a given mould and hold it there until solidification begins. Excessive pressure will not, under ordinary conditions, prevent the normal contraction of gold, because the mould into which the gold is cast yields, and hence will distort in the same proportion as excessive pressure is applied. It may be true that a pressure of 2000 pounds per square inch may totally prevent contraction, but what would become of the mould?"

(4) "It is unfortunate that more operators do not realize the true value of an efficient casting apparatus such as the Taggart and the false economy resulting from the use of an intrinsically faulty or make-shift device" (L. J. Weinstein).

(4) "By using a grade of silica of maximum *expansion*, and a grade of plaster of minimum contraction, it is possible to produce an investment compound that will follow the flask walls

when heated, and which will in some measure compensate for the 2% shrinkage of all castings."

Casting Metals Used

A history of the experiments made to determine a suitable alloy for casting clasps might be interesting but not necessarily instructive. The decision took me two years, as alloys had to be tried out in actual use as well as in laboratory tests. For most of the metallurgical data and work I am indebted to L. J. Weinstein of New York, a graduate of the School of Mines of Columbia University and Director of the Columbia Post Graduate School of Dentistry. The actual working tests in the mouth, and the technic of clasp casting, I had to work out myself. The clasp casting alloy that has been put on the market after exhaustive test proving its worth, is a combination of an alloy known as "Elastic" gold and No. 68 Solder. The "Elastic" gold gave good results, but had too high a melting point, which, as has been outlined, is detrimental if clean sharp castings are to be made. Additions of the No. 68 Solder lowers the melting point to 1945° F., the same as pure gold, and the one part of zinc acts as a flux and makes a smoother casting alloy.

(5) "This property of some of the lower fusing metals to act as fluxes and deoxidizers is utilized by steel and iron founders, who often add a very small per cent of aluminum to their molten metal just before pouring, claiming that the metal so treated stays in a pourable condition much longer."

Casting gold "E" can be cast perfectly in a *cold* mould, the resulting casting having sharp edges, and remarkable freedom from flaws and pits. It is very strong and tough, possesses spring and resiliency and best of all, *holds* that spring under use and under soldering conditions. It appears practically immune to temperatures below the melting point of pure gold. Other alloys tried were disappointing in this respect, as they either became extremely brittle under soldering heat, or else softened considerably and lost their desired elasticity. In color, the "E" gold is a yellowish gray, hardly distinguishable from platinum, and its texture being very dense, it takes and holds a fine polish, and like platinum is unaffected by oral fluids. It will

bend to a limited degree, but is not meant to be bent like other clasp metals.

Formula.	
Gold	65.0
Silver	4.0
Copper	9.0
Platinum	8.5
Palladium	12.5
Zinc	1.0
<hr/>	
	100.0

= 21

After casting, the clasps are freed from all adhering investment, boiled in acid bath, and all nodules and rough edges smoothed off. They are then sprung onto the model teeth and we are ready for the next step. I have used the Ash tube teeth in most of my cases so I will describe their use. I prefer them because they enable me to use a maximum amount of porcelain with a minimum weight of gold framework, and when ground for correct shape and occlusion they can be beautifully repolished. The Goslee teeth or the Davis crowns for metal work can be used to good advantage.

The middle section, comprising the saddle, cup for porcelain and post is then cast. Usually, I prefer to use for a post a piece of high fusing clasp metal wire of No. 14 (B & S) gauge, pick it up in the casting and afterwards make doubly secure with a bit of solder. This middle section is cast with Ney's casting gold "B," the only variation in technic being that the casting is made in a hot flask, for by so doing, a better union between the cast gold and the post or posts is more likely to result. After cleaning and pickling, this middle section is placed in proper relation to the clasps on the model, plaster relations of the parts taken and the three parts assembled with one soldering. If the clasps are as accurately fitted as they should be, any very slight change during the soldering will disturb the relations of the three sections so that the bridge will not go to place on the model, and the resulting appliance will not prove satisfactory. When the framework is found to fit the model as desired, the porcelain

tooth is cemented to place, and all metal work nicely smoothed and polished. Then final adjustments for occlusion are made, the ground surfaces of the porcelain polished and the bridge is ready for the patient. As stated before, if proper care and attention have been paid to every step, the bridge should require but little adjusting at the chair.

This technic will not appeal to the man who wants "hurry up" results, or who expects that this form of bridge, although simple, can be constructed for a *small* fee. A careful tabulation of working time required in an average case shows one hour of chair time to get data and adjust bridge with instructions to patient as to care of same, and from six and one-half to eight hours' laboratory time required. It will, however, appeal to any patient who has lost teeth through the failure of fixed bridgework or who has sat for hours in a dentist's chair, having his teeth and roots prepared for other forms of either fixed or removable bridgework. And in this era of strenuous war times, the patient's time is a factor demanding some consideration.

Advantages and Disadvantages of This Method

1st. No devitalization. We are living in an age of *prevention* and any method conserving the vitality of the teeth is worthy of consideration. We need no more deliberately devitalize two perfectly sound teeth as has often been done in the past, just to supply one missing tooth.

2nd. No excessive grinding and mutilation of tooth surfaces, which often results in death of the pulp.

3rd. An appliance that is simple for the patient to clean and care for, can be easily removed by the patient, boiled if necessary, and has no troublesome tubes, slots or sockets to be kept clean, as in other types of removable bridges.

4th. Will stay in position *under service*, and is rugged and dependable under most severe conditions.

5th. Can be constructed with a minimum of nervous strain to the patient and dentist. As but two appointments are required, the dentist's operating time is greatly conserved.

6th. Is almost universal in application where indicated—

that is, for posterior teeth, where there is a sound abutment at either end of the space.

7th. Is easy to repair should breakage occur.

8th. Can be constructed by any dentist with a good working knowledge of gold casting and soldering operations, who can construct a *well made* fixed bridge, but cannot be "made to go" if carelessly constructed by the type of operator who cannot make a good fixed bridge, but who "gets away" with it because it can be jammed on with cement—and cement hides a multitude of sins—or did hide them until the radiograph came snooping along.

Disadvantages

The disadvantages come under three heads.

1st and most *important* is the liability of injury to the enamel surfaces under the clasps. We should select our cases for this appliance with great care, and not blind ourselves or our patients to the fact, long ago pointed out by Dr. Bonwill, that dissolution of the enamel and caries of the dentin will take place under this or any other type of clasp unless strict attention to cleanliness is observed. The fact that this kind of clasp does not allow room for any appreciable amount of food debris to crowd between it and the enamel, should not lure us into a false sense of security when it is used on teeth of soft and chalky structure, or where the toilet of the mouth is neglected. I believe that with proper care and watchfulness on the dentist's and the patient's part, time will show that no great amount of damage will occur under the clasps. And granting that it does occur, can it not be easily repaired with the many means that we have at our disposal? Surely such small damage that will come will be of less moment than the serious troubles that are resulting from devitalized teeth; and of the two evils I am prone to choose the lesser.

2nd. The second disadvantage is that which applies to all forms of removable bridgework—namely, absolute accuracy at every stage of the process. The success of the entire structure hinges upon the taking of a correct plaster impression to start with, and strange as it may seem, that has been the hardest thing to teach the practitioners desiring to learn this method.

3rd. The third disadvantage can also be said to apply to other forms of removable bridgework, but possibly more so in the case of the clasp type. I refer to the liability of a patient swallowing one of the appliances. It is fairly easy to let one slip while removing or inserting it. I have not been unfortunate enough to have this accident occur to any of mine as yet, and caution patients to be careful; nevertheless it is an accident to be feared as the results might be serious.

It would not be proper to dismiss this subject without a word as to the instruction to the patient as to the care of the bridge and abutment teeth. These bridges, when fitted properly, are so comfortable that cases have been reported to me by dentists where their patients had neglected to remove the appliance for cleaning for two weeks at a time. I consider this the fault of the dentist and not the patient, although some patients are proverbially lazy in this respect. My patients are told very plainly that the penalty of any neglect in the care of teeth under the clasps will be carious teeth. They are also instructed in the care of clasps. Thus far, after a period of nearly four years I am not seeing the rapid decay that some of the "wise ones" promised when I began my first experiments.

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ULCERATIVE STOMATITIS ASSOCIATED WITH VINCENT'S ORGANISMS

BY LIEUT. WILLIAM HARRY GULLIFER, D.O.R.C., U. S. A.

WITHIN the last few months I have had occasion to treat and thereby observe a condition of ulcerative stomatitis or gingivitis associated with the microörganisms of Vincent; or in other words, associated with spirochetæ and fusiform bacilli.

The constant finding of these organisms, upon microscopical examination of the material from diseased mouths, and the absence of them in normal healthy mouths, has led me to believe that this condition has its etiology in these bacteria and that it is not unlike the Vincent's Angina of the tonsils and pharynx.

In fact, in one case, the infection started about the gingival tissue in the right superior and inferior molar regions and three days later had spread to the tonsils and pharynx.

It seems to be a disease particularly prevalent and confined to our new troops training in France. As yet I am at a loss as to what to attribute it to, but to my mind, it is not altogether impossible to believe that the oral neglect which is apt to follow camp life, and the close contact which does exist between the men, may in part, at least, predispose to and promote this affection.

Etiology

As I have said before, we are led to believe that this type has its etiology in the organism mentioned above, but, nevertheless, ulcerative stomatitis may be the result of a number of factors, such as a disordered general system or unhygienic condition of the oral cavity with carious teeth, with such debilitating influences as excessive smoking or drinking, or previous venereal disease acting as predisposing causes.

The majority of the cases under my care have given a history of excessive smoking and considerable drinking. A good many have given the history of previous venereal disease and the mouths of these individuals almost invariably have been in a very

unhygienic condition with more or less accumulation of salivary deposits and food debris. Occasionally, however, this condition is found in comparatively clean mouths.

As the infective type of ulcerative stomatitis is more or less of a fermentative nature, a dirty mouth affords ample opportunity for the organisms to multiply and flourish.

Symptoms

The symptoms are characteristic, with the grayish white sloughs extending along the gum margin and into the interstitial papillae. The papillae seem to be affected first and in many cases flatten down giving the appearance of a straight gingival margin along the necks of the teeth. It is irregular in outline and confined to the gingival tissue as a rule, although it may appear on the mucous membrane of the lips, cheek, and hard and soft palates. Some of my cases, in addition to the gum condition, have had small but rather deep ulcers appear on the mucous membrane of the lips and palate. Upon removing the sloughs the tissues bleed freely. The neighboring lymph glands may be enlarged and tender with some swelling in severe cases. Salivation is increased.

The breath has a peculiar and rather characteristic fetid odor and the patient complains of loss of appetite, constipation, headache, etc. In some cases there is marked septic absorption with loss of weight.

Diagnosis

The diagnosis is comparatively simple. It is based upon the symptoms enumerated above, plus the microscopical findings of fusiform bacilli and spirochetæ, to the exclusion of other bacteria, prepared from a smear taken from the diseased tissues. This smear should be prepared after the mouth has been rinsed with normal salt solution or water to carry away any surface foreign material present.

Prognosis

The prognosis is good if treatment is instituted immediately and followed up closely. Usually the condition is much improved in two days and entirely relieved in about one week.

Treatment

The cause or causes must be removed if permanent results are to be expected. This process usually consists of placing the mouth in a hygienic condition by first removing all of the deposits present. The patient should be impressed with the importance of absolute cleanliness and the necessity of brushing the teeth at least three times a day, and especially the last thing at night, regardless of the soreness of the gums.

The sloughs should be picked off everywhere, and the raw, bleeding surfaces dried and touched up with 0.05% chromic acid or 95% phenol.

As potassium chlorate is of value in these cases, a wash should be prescribed. The following is one that is useful and which I frequently advise, viz:

℞ Potassii chloratis.....3j"
 Tincturae Myrrhae.....3ij
 Alcoholis3j"
 Aquae Cinnamoni q. s. ad.....f3vi

Sig: Use as mouthwash three times a day and if too strong, dilute.

Potassium chlorate (full strength) should be given in tablet form and occasionally one should be dissolved slowly on the tongue.

A cathartic should be prescribed and the bowels kept open.

Carious teeth must be filled and after the infection is controlled, all old broken down roots should be removed. All irritating factors should be eliminated, smoking and drinking reduced and any venereal disease must be properly treated.

Strict observance of the above treatment, with coöperation between patient and dentist, will bring about prompt and satisfactory results in a surprisingly short period.

Base Hospital No. 6, American Expeditionary Force, France.

THE MOUTH IN THE STATE OF HEALTH¹

BY FREDERICK BOGUE NOYES, B.A., D.D.S.

Chicago, Ill.

IT is not an easy thing to define a state of health either for the individual organism, or for a tissue. I assume that all the men in this room are in a state of health, but I suspect that there are a considerable number who are not in perfect health; and so if I attempt to define what constitutes a state of health, either for you or me as individuals, or if I try to explain what constitutes the microscopic state of health of any particular tissue I am undertaking a difficult task. It is very hard to draw the line between the state of health and the state of beginning disease, and that is the more true from the microscopic standpoint, because with many tissues, a part of the state of health consists in their ability to resist the beginnings of disease. So a perfectly healthy tissue must be able to combat the beginning of disease.

Now in studying this subject during the last three years, in connection with disease of the peridental membrane, I have had that constantly forced upon my mind. I doubt if one could find a mouth which the most critical dentist would pass as being in a state of health, and yet if the microscopist should make an examination, he would find areas of inflammation—areas of limited extent in which the tissues were beginning a conflict, and the ability to cope with the invader is part of the function of the tissue. That emphasizes the point I wish to make.

If I think of the deviations from health, I find there are several kinds, disease, deformity and abnormality. One may have a deformity which is not a disease, but which may be a result of disease. It may give a tendency toward a beginning of disease, yet the tissues are not in a condition of disease. In a similar way, one may have abnormality of structure. It is not a diseased structure. The tissue is not in a diseased condition,

¹ Address before the First District Dental Society, S. N. Y., Oct. 1, 1917. See Disc. p. 68.

but in an abnormal condition, its tissue elements, in number, character or arrangement being atypical or unusual. These things interlock with what constitutes a state of health.

In the mouth, deformity almost invariably has a tendency to encourage the beginnings of disease; so in considering a state of health of the human mouth, we must consider abnormality and deformity. While not constituting a state of disease, they tend toward it, or incline to the beginnings of it. I would hardly declare a month which was markedly deformed in a state of health, because it does not perform its functions in the most perfect fashion; yet it might not be in a state of disease. Those two conditions are therefore intermediate between actual health and active disease.

If I were to try to state the conditions that are essential to a state of health in the human mouth, I might summarize them under certain headings.

First, I would put occlusion. Why? Because occlusion not only is one of the most important factors in the maintenance of the state of health in the mouth, but we need to realize more than we do as a profession that occlusion is the mechanism through which normal function moulds every anatomical detail of its entire structure. So, during the whole period of development of the human mouth, occlusion, through the forces generated in function, is the means of development of the anatomical form and the most minute microscopical detail of every structure, and is one of the most powerful factors in the maintenance of health. A whole evening might very profitably be spent on occlusion as a factor in the state of health of the mouth.

Second, tooth form and tooth structure are factors in the state of health of the mouth. The form of the tooth must be approximately normal, in order to produce the normal contact—the normal relation of one tooth to another, without which, normal mastication cannot be performed without injury and without affording the opportunity for the beginning of disease. Tooth form in itself determines the character of interproximal space, and the provision for the nourishment of the surrounding and supporting tissues.

Tooth form is one of the most important factors in the

beginning of that disease which does more to destroy the health of the human mouth than any other—caries of the teeth; so we might spend almost an indefinite amount of time on tooth form and tooth structure, as determining the health of the mouth.

Third, the relation of the supporting tissues to the tooth and the relation of tooth form to the protection of those tissues might well be elaborated upon, especially the study of tooth form in all reconstructions.

It would be worth while to spend more time than we can studying the relationship of labial and lingual contours of teeth to gum outlines, with reference to the relation of food movement over the soft tissues in a state of health, because the moment we have a deviation from that condition which is typically true of a healthy mouth, we have the opportunities for the beginnings of disease, which almost always, if not invariably, follows those deviations. We must pass those conditions with only a reference.

Fourth, resistance to infection is a factor. The individual, from the cradle to the grave, is in one continuous battle with infection—a battle which infection wins in the end. There is probably not a moment in the individual's existence at which, at some point or position, there is not at least a skirmish on this battle front. So we must study infection and the absence of infection—the degree of reaction to infection, and as I said in the early part of my paper, I doubt if one can ever find a mouth in which, if a complete microscopical examination were made, he would not find evidence of intense battles. It is apparently a normal function of that tissue, and only because of the adaptation of the tissue to mobilization of its forces at the point of attack and the preparedness of the tissues to meet the invasion at the beginning, is the system saved from infections which would destroy it entirely. Accordingly, we must study resistance to infection as a factor in the health of the mouth.

Fifth, we should consider the condition of the fluids of the mouth as determining the state of health, including the character and even the detailed habits of its flora, and the minute one steps into that realm, he is in a field where only the beginning of a great territory has ever been explored. All we know can

be summed up in a very few words—and perhaps not everyone would agree with those words; but certainly it is safe to venture that the condition of the contents of the mouth—that which is found in the mouth cavity—determines to a very great extent its state of health, in that it is a reflex or part of the general systemic condition; and when we say that, we say nothing that we understand.

We know, however, that the character of the contents of the mouth cavity varies because of conditions of the general system, and the condition of the contents probably determines its flora and their activity; also, the activity of attack upon the tissues of the tooth itself, and consequent liability to that disease which is the forerunner of most of the diseases of the mouth.

Each one of those factors which must be considered in estimating a state of health in the mouth, is a large enough subject for more than one evening.

In considering the tissues, I am going to present them, if I can, with reference to their adaptation to the function which they perform, and their ability to resist the beginnings of disease. At no time in the history of the dental profession have the problems before it been so closely related to tissue structure as at the present time. The greatest problems of the present day demand that we study more minutely than we ever have the microscopic arrangement of tissues, and what is going on in those tissues in the states of health and disease.

We cannot do any of the things we are called upon to do with the interpretation of roentgenograms, except by applying to the pictures a knowledge of the minute arrangement of the tissues.

Those things are useful to a man actually in every day practice only in proportion as he vividly and actually imagines them to himself. A man may know a thing, but unless it becomes a real living thing to him, it is a part of knowledge which is not applied. No matter how many times we have gone over a thing in an academic way, we may go back to it again and each time get a new view of it and its relation to the concrete things we have to deal with in practice.

I want to present some of these things in relation to the interpretation of a state of health in the tissues, and to show more

clearly what variations there would be in a state of disease, and how one should look for them.

First, however, I want to call attention to something I have emphasized often in the last few years—the homology—the comparison—between the tooth and the hair. I want to emphasize the similarity in the relation existing between the tooth and the human mouth, and that of the hair to the skin; and if you should study the matter, you would find that the hairs and the hair follicles become points of entrance of infection, and that the relationship of the tissues around the shafts of the hair follicles are directly comparable to the relationship of the epithelial tissue and mucous membrane around the teeth.

Now if the hair on the surface of the body is a point of beginning of infection, why should we not expect that the similar relationship in the mouth would be one of the points of beginning of infection, and why should we not be prepared for attack in those positions?

Description of Slides

This is a frozen section of the mouth cavity, and the mouth cavity is really two cavities; for it includes the space between the lips and the outer surface of the teeth and alveolar process, and also the second cavity inside of the teeth. In the normal condition both of these cavities are not cavities at all, for both are filled except when the mouth is open. When the teeth are in occlusion, the tongue occupies the space of the inner cavity, and the lips lie in contact with the teeth in such a way that there is actual pressure and air exhaustion and a condition of tension. This is an essential factor in health. The moment this condition is disturbed, the whole balance is upset, including the relationship between the mouth surface and the nasal surface of the palate. The tension upon the mucous membrane is affected, as is every gland, and there are millions of them which open upon all the surfaces inside and out.

This normal condition of the mouth cavity is one of the first essential factors in a state of health of that cavity. Anything which disturbs it, upsets the whole general arrangement, and while we may not have a diseased condition as a result, we

have an abnormal condition, and soon a deformed condition, and those lead to the beginnings of disease.

I want to call your attention to what I consider one of the most remarkable pieces of writing in modern dental literature, namely, Dr. G. V. Black's description of the structure and function of the gum tissue, in his "Special Pathology." If you have not read it, do so, and study it. This tissue, which covers the bone in this region, and which lies next to the teeth—is a very remarkable structure in its physiological character. If one cuts the surface of the skin in most places, the wound gapes open. If he cuts a gash in the gum tissue, the edges stay tight together, like a cut in unvulcanized rubber. The secret is that the gum tissue lies upon a pad of fibers, in which the fibers are in such relationship that when they are severed, they will still lie in contact, so that instead of leaving the underlying tissues open to infection, the tendency is to close immediately. The character of this tissue, which covers the surfaces of the bones and makes what we call gum tissue, is worthy of a great deal of study.

I referred to occlusion, and I have put this slide in to emphasize the fact that occlusion is something more than the relationship of teeth to each other. The dental profession owes Dr. Angle an immense debt of gratitude for presenting occlusion as a means of distribution of functional forces, and we should realize that in the formation of the healthy mouth in the period in which it is developing to its full normal size and character and function, it is the occlusion which is distributing all of the developmental forces, including those which are caused by the enlargement and growth of the surrounding muscles. In fact the growth of every part is kept in harmonious balance through the relationship of the cusps of the teeth to each other, and that development is one of the most important factors in the state of health. Any deviation from the normal, in the relative positions of these occlusal planes, while not constituting a state of disease, is an abnormality which produces a deformity, and the deformity needs to be corrected or else it leads to disease.

I said occlusion in itself is one of the most important factors in the beginning of disease. I am not going to analyze it completely, but I want to point out that in the general plan of occlu-

sion, each tooth occludes with two others, and the cusps force the food over two other cusps, so that if they are used as nature intended them, with the kind of food nature intended, they will keep the teeth clean. That one factor in the arrangement of the teeth in normal occlusion, with normal function, will keep tooth surfaces in such condition that caries will not begin.

The form of the tooth to a great extent determines the character of the interproximal space. This illustration, Dr. Black arranged, to show the form of the interproximal spaces between the molars and bicuspids, and particularly the width of those spaces with reference to the health of the tissue which occupies them. The minute this is constricted, by the mutilation of the tooth or the abnormal position of the tooth, the nourishment of the tissue between becomes impossible, and then comes the first change of that tissue from the normal, and the beginning of disease. The form of proximal space is therefore an important factor for the tissue which occupies the space, and its maintenance.

Now the enamel. I have said that the most perfect enamel is imperfect. That is true, if one considers the enamel as a tissue which covers the surfaces of the teeth for the purpose of protecting them. Even if one considers the minute structure of the enamel as a perfect example of the type of that tissue, nature has not evolved perfectly the intention; for the most imperfect enamel remains sometimes through life without destruction, and the most perfect enamel that we ever have melts down like sugar in other individuals. Therefore, I say that the enamel and its structure is not one of the most important factors in the state of health of the mouth. It is the environment of the enamel which counts, rather than its condition.

Right at the present minute, there is more need of accurate, careful study of the dentin than any of the other dental tissues. The microscopic study of the dentin brings up many questions which are vital in relation to this question of "What are we going to do with teeth without pulps?" That question will not be answered properly until someone does a lot of work on the histology of the dentin. I am not going to tell you what I know about it, because I do not know enough yet to talk about.

In the last two years I have been amazed at what is going on in the pathology of the peridental membrane, and in the cementum. We have not given the cementum its due. It is an active tissue, and it behaves like all other tissues, for it responds to the beginning of disease—it responds to attack. The first symptom of attack is irritation. If I attack you, you are irritated, and the same with the tissue. If you are irritated, you begin to do something; so does the tissue. At first its activity is perfectly normal—one cannot detect any difference between the normal processes and the first reaction to irritation, but as the disease progresses, the activity becomes more feverish, and it deviates more and more from the normal. That has not attracted any attention in the case of the cementum until very recently, and I think it is an important factor.

Moreover, the formation of cementum is the only way the surface of a root is repaired. The dentin has absolutely no ability to do any reconstruction except on the pulpal surface, but the cementum is reformed, and covers over the surface of dentin, and reforms the smooth outline of the root. That is a characteristic of the cementum in its normal condition.

Now we come to the dental pulp. It is a very peculiar tissue. It is made up of a lot of cells, which are represented here by the dark spots. Those cells do not lie close together, but are scattered in a gelatinous intercellular substance, which we do not know much about.

On the surface next to the dentin, there are the odontoblasts, and there is a layer in which the cells are rare, another in which they are more numerous and then another where they are still more numerous.

As to the odontoblastic fibrils in the dentin matrix—what becomes of them? Here you see where the odontoblasts have been torn out, and only a little layer is left. If you have removed many pulps from pulp chambers, you realize that when you take a pulp out, you do not get the whole of it. A pulp comes out, and you hold it up on the broach and say: "Isn't that beautiful—I have the whole of it!" But you will find you have left a whole lot there, and unless you scrape the pulp chamber you do not get it out.

Take big pulps from young sheep or dogs, and work with a dissecting microscope, and if you get half a dozen patches where the odontoblasts came off with the pulp, you are in luck. The rest are left sticking to the dentin. That is all I will say about this subject, but just remember it the next time you think you have all the pulp out.

The most remarkable thing about the pulp is its circulatory system. This is a color drawing, showing the network of blood vessels in a dental pulp. If you ever get hold of Stoll's work, read it thoroughly, because it is a beautiful word picture. He says: "A well-injected dental pulp is a beautiful object to look at with a binocular microscope, because of the interlacing of the arteries and veins."

All of the authorities in English state there are no lymphatics in the dental pulp. Two years ago, I did some work with Dr. Dewey in the University of Illinois on the lymphatics of the dental pulp. I think it has now been satisfactorily demonstrated that there are lymphatics in the dental pulp, and if they are there, it is an exceedingly important thing in relation to disease.

In 1907-1909, a man in Berlin, named Sleizer, working by a new method, made some experiments in which he showed injecting material in what he determined were lymphatic vessels in the dental pulp. He inserted it in the gum tissue outside the alveolar process, and by careful manipulation the lymphatic vessels were injected backward.

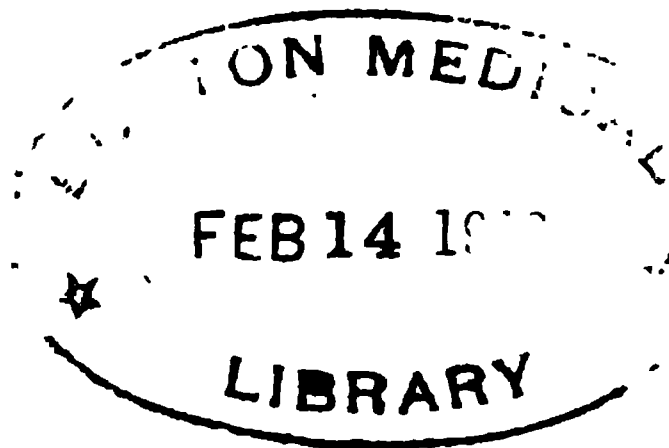
A number of men in Germany have attempted to inject through the tooth, but have absolutely failed. The results were entirely negative. Dr. Dewey and I undertook to repeat that, and worked up some special apparatus. The first dog we tried, we got a result with, but we repeated it on ten different dogs with negative results. If we had struck those ten dogs first, we would probably have stopped the experiment. In these first ten, we injected the blood vessels first with carmine gelatine. What happened? In the pulp all of the blood vessels were expanded beyond normal, and that so constricted the lymphatics that it was impossible to force anything into them; but when we injected the blue material first, in the lymphatics, and then injected

our blood vessels through the artery, we got our results every time.

That is certainly of importance with reference to the exposure of pulps in temporary molars in children, and the possibility of developing tubercular infection in the glands of the neck. That was the motive which led the German investigators to begin work. Their hypothesis was that tubercular glands sometimes follow exposure of the pulps in molars, but their results were negative.

It is an exceedingly difficult thing to demonstrate this condition, because of the minute character of the vessels. One can hardly see them without a magnifying glass, and consequently, you must either take my word for it or come and examine the dissections.

No. 1428 People's Gas Building, Chicago, Ill.



THE DEVELOPMENT OF OCCLUSION¹

By ALFRED P. ROGERS, D.D.S., Boston, Mass.

YOUR committee has provided for your winter's study a series of lectures designated to illustrate, first, the human mouth and its surrounding tissues in a state of health; second, its various phases of abnormal development or disease; third, its restoration or development to the normal.

In order to present these subjects in the best way, the lectures have been arranged in a sequence, which, I trust, when fully presented will yield a wealth of instruction, resulting not only in a valuable addition to our knowledge, but proving also a stimulation to greater effort and more numerous successes. Two of these papers have already been read to you by men well qualified by study and experience. Whatever in their papers may have a bearing upon the subject matter of our present study you will readily recognize and no doubt apply.

You will understand, I am sure, that in treating the subject, "The Development of Occlusion," it will be impossible for me to begin at the beginning and carry you through all that the subject might call for in its complete treatment.

My efforts for you must consist of a more or less incomplete account of my own experiences in the important matter of corrective treatment, and its retention, *particularly during the important period of abnormal variations of development*. From the nature of our study, interest cannot be confined to the teeth alone, but must broaden until it embraces those surrounding parts which will be recognized as of vital importance, not only to the successful establishment of occlusion, but also to its successful maintenance.

Before I take up with you any consideration of the practical aspect of orthodontia it will be necessary for us to endeavor to obtain a clear conception of the present scope of the science.

¹ Read before the First District Dental Society, S. N. Y., Dec. 3, 1917. See disc. p. 7.

No one of you who has interested himself in orthodontia many years can fail to be impressed with its growth in its different directions. It would be indeed interesting to review these various stages of progress, but its details are, I assume, quite familiar to most of you, and I shall, therefore, pass over them with slight reference. However, in order that we may all start with a common view point, I shall endeavor to define the various subdivisions of our science and lightly trace their connections.

It is true of orthodontia, as it is true of medicine, that the history of its early practice shows that it was conducted in an entirely empirical manner. Gradually the methods of empiricism were tested and sifted through the meshes of scientific thought until there was established the basis of the science of orthodontia. We understand the importance of these early stages when we become mindful of the fact that empiricism is the origin of much of our knowledge. It is simply that we learn from experience, for this great teacher constituted the foundation of practice for our predecessors. Their operative procedures were established solely upon their accumulated experience. In those early days, methods of art as applied to orthodontia were crude and quite inefficient. The systematic application of knowledge and skill in effecting wished for results left much to be desired before it could be defined as science, or recognized as art, but, as the methods of empiricism became more thoroughly understood, science began to appear in our theories and practices. Knowledge became systematized. Particularly is this true in reference to their discovery of the underlying truths, such as the "laws of occlusion," and the resulting first classification. Later in its development came the employment of systematic knowledge as applied to physical, mechanical and mental sciences.

You can readily understand then how each of these attributes—empirical practice, art and the collateral sciences, became merged in such a way as to form the real foundation for what is now regarded as a true and useful science. Some still fail to recognize this interdependence, and are apt, even yet, to lay undue stress on the importance of one subject over the other. For instance, the scientific mind, embracing as it does the cold and inflexible methods of science, is sometimes unmindful of

the aid furnished it through the agency of art or the methods of empiricism. The craftsman fails, at times, in his recognition of these important scientific principles which are recognized as essential. Some minds fail to recognize either science or art. Their efforts are recognized by the grossest misjudgments and the crudest attempts. Others do not yet recognize that psychology has an important part to play in the management of children during the correction of malocclusion, and many also fail to recognize the value of scientific exercises of the various muscle groups. It is not good judgment, then, for any one to proceed upon the practice of orthodontia unless he is willing to give the proper amount of attention to the consideration of all of these.

By no amount of study can the man who is destitute of the instinct of the artist acquire that delicate manual skill that is necessary for accomplishment. Neither is it possible for the one destitute of knowledge of practical psychology to deal successfully with the many harassing problems of harmful habits in the child. The man who is destitute of the teachings of the purely scientific aspects of our work, is as truly at a loss as the untutored in any other field. If anyone chooses to ignore these basic principles in the practice of orthodontia, he is, at once, at a loss upon what to base his judgments, if indeed he proceeds at all upon a successful course in the treatment of any given case.

Standards and Principles

In order to attain progress in almost any undertaking, speaking in a practical sense, it is of the utmost importance that sufficient attention be given to seeking and finding standards and principles. These important elements are established and formulated largely as a result of study and experience. In seeking and finding them one lays the foundation for future usefulness and success.

We are fortunate in having found a standard that is stable. Its fundamental qualities are the same in all races of men. It is true that in many instances our standard is hard to attain, but even so it is to be the constant goal for all our endeavors. Often the attainment of our standard of occlusion is made difficult because the surrounding tissues of the mouth and face have either

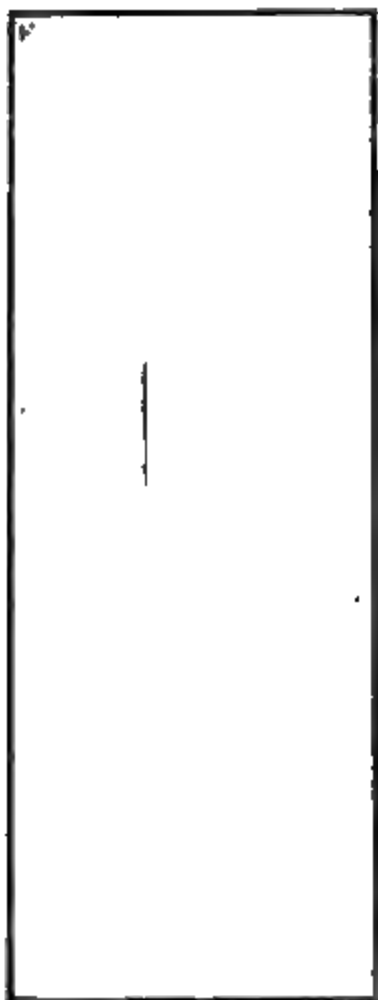


FIGURE 3

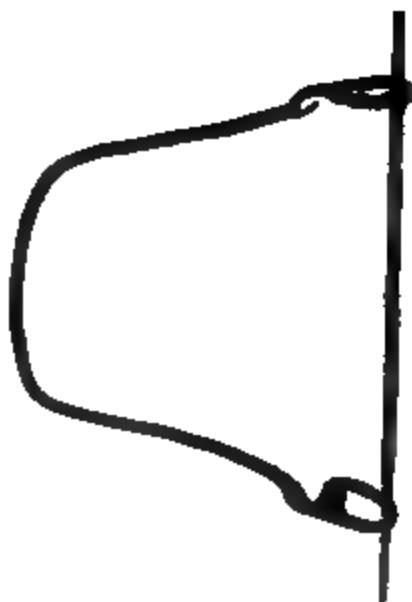


FIGURE 4

FIGURE 1.

FIGURE 2.

some acquired or inherent abnormality in form or action. Sometimes there is an over intensity and sometimes an undue laxness in some particular group or groups of the facial muscles. The muscular balance is often so interfered with that it becomes a serious problem and one that we have not yet fully understood or mastered. Our lack of knowledge in this particular accounts for a large percentage of our failures. The standard (Fig. 1) that nature has placed before us, is faultless in its harmonious development.

What conclusion must we form from such a guide as this? Is there anyone who is willing to undertake the correction of malocclusion, without first recognizing this standard, and without preparing himself in every possible way to secure ability in his work? What does this beautiful picture reveal? Is it wise or profitable in any given case of malocclusion for us to direct our attention solely to the teeth? Is there not a standard of development represented here other than that of the teeth? Are they to be framed with indifference? Shall we not seek also a standard of bone development and muscle development? Are these not essential to the full development and maintenance of occlusion?

Plan of Treatment

I know that you believe with me that the plans that we are laying must be traced in such a way that *the teeth, the surrounding bony tissue, the muscular tissue and function* be rendered *normal* in the *best, easiest and quickest way* that our knowledge can devise.

It is, therefore, our duty to study not alone occlusion, but the health and normality of all these surrounding tissues. One of our first duties must be to develop the tissue which is to receive the permanent teeth upon their eruption, commencing at a comparatively early age. *Whatever mechanical stimulation we choose to employ, we must follow it with the development of the function of mastication through muscular development. We must encourage also the development of the respiratory function through adequate and proper exercises. In each case applying methods most suitable to the character of the maldevelopment.*

Principles of Construction of Appliances

Before we take up the consideration of the treatment of the various cases that I have for your study, let us review some of the important principles involved in the construction of appliances. An orthodontist in his construction of, and in the application of appliances should be most exact in all that he does. His motives should be clearly defined. *He should not forget that he is responsible for the health of the tissues immediately surrounding the teeth, as well as the health of the teeth themselves.* Hastily gotten up appliances, ready-to-wear appliances which are oftentimes inadequate even when carefully adjusted, are to be avoided whenever possible. *The construction and application should be made so carefully that the patient is given the minimum of discomfort not only during the application, but during the long period of their use.* The operator must feel sure that in making this application he not only is causing no harm to the tissue, but is actually, in many cases, affording means of protection of tooth surface through those inevitably careless years of childhood.

The principles that underly normal development and normal changes of the tooth position must not be ignored or omitted from the plans of construction, or he will in some instances interfere very seriously with the normal processes of development. This principle applies more particularly to the application of appliances to mixed dentures, and must in no instance be forgotten when efforts are being made during this period of transition.

The most valuable appliances are those which interfere least with the normal tendencies of development, and in their construction and adaptation are freest from interference with muscular activities and habit forming possibilities. When it is found necessary to interfere with any normal function, whether it be of the tongue, lips or cheeks, some form of compensation must be provided. Possibly an illustration here will help us to grasp my meaning to better purpose. The drawing represented in figure 2 indicates the direction of the movement for each of the three appliances: Labial wire, Pin and Tube and Lingual wire. It will be seen that with the use of the lingual wire there is greater opportunity for muscular influence in its relation to

FIGURE 5.

FIGURE 6.

Figure 7.

Figure 8.

the individual tooth movement. The expansion arch which for so long a time was our mainstay is in my opinion, in the light of recent years of experience, a more or less troublesome appliance; especially in regard to its effect upon the normal action of the lips and cheeks, and most noticeably so when it is poorly adjusted as is most often the case. It will be seen that this application, even when neatly accomplished, interferes and forms a barrier between the lips, cheeks and teeth so that their normal function is seriously interrupted.

It has not the virtue of being provided with a compensatory force such as may be found, for instance, with the pin and tube appliance (Fig. 3). Unfortunately, the pin and tube appliance in its most useful form is difficult for many to construct. Its various forces, compensations and reactions are so imperfectly understood, that for many, its successful use seems difficult. The most generally satisfactory appliance that I have found, especially in the treatment of many young cases, is the lingual wire (Fig. 4) which, when properly understood, applied and manipulated, forms an almost ideal agent for painless development. With this form of appliance the lip and cheek functions are not interfered with in the least. *Its employment gives the greatest encouragement and opportunity for the valuable assistance of properly prescribed exercises.* Its interference with the functions of the tongue is very slight, if it is properly adjusted, and the individual teeth are free to develop normally with the exception of the molars. But it has its advantage even here, as its attachments afford a direct means for the control of the molars (Fig. 5), and is especially valuable when rotation is called for. It is good practice when practical, to remove this form of appliance during the period of molar drift, or else to apply some compensating force such as may be given by weak inter-maxillary elastics. In some cases it is possible to stimulate development of the upper arch by producing a slow progressive development of the lower, by use of the lingual wire, causing adjustment of the upper by a system of exercises designed to stimulate the upper.

It is my purpose tonight to carry you rapidly through stages of treatment from the abnormal to normal in the deciduous dentures. From there through the period of transition to the

attainment of the normal in the permanent dentures, touching lightly in the principles involved in the development, and its most efficient means of retention.

Study of Cases from Practice

My first picture (Fig. 6) in this series shows the abnormal deciduous denture of a child of six. You will notice it is a class two case with the period of normal inter-dental development past, without the appearance of the normal inter-dental spaces. The distal position of the mandible is due only to the interference caused by a restricted upper arch which has hampered the pterygoid muscles in their efforts to adjust the mandible to its normal position. The right of this picture illustrates the normal development of another child of six years of age. It is a good example of perfect bone development and normal mandibular placement.

Our next picture (Fig. 7) illustrates a child of five with the same form of malocclusion which we have just studied, and which has been successfully corrected by careful and slow development of both arches. The upper, by means of a delicate pin and tube appliance; the lower, by means of a lingual wire. The mandible readily took its normal position when the treatment had progressed far enough to remove the interference. Figures 8 and 9 illustrate the occlusal views before and after development. Those of you who are acquainted with the normal deciduous arch will readily recognize the normal curve which has thus been produced.

The next (Fig. 10) illustrates the appliances used in this development. That of the junior pin and tube appliance and lingual wire. These forms of appliances I wish you to carry in your minds during the remainder of our study of cases before and during treatment. These appliances, with modifications, were used in all cases which will be described until we reach the full eruption.

The next case (Fig. 11) in many respects is similar to the one just shown, except that there did not exist in this malocclusion of the deciduous teeth, sufficient interference to cause distal position of the mandible. One of the remarkable features of this case

FIGURE 9.

FIGURE 10.

FIGURE 11.

FIGURE 12.

is that the child in every respect presented the characteristics of being under six years of age, although she had passed the age of seven and a half years before the first cast was made. Another feature which I wish you to notice is that the deep overbite has been readily corrected during the process of developing both arches to their normal shape and size. The figure on the right represents the same case in its normal development, corresponding to the physical development of the child. Lingual wires and exercises are the remaining elements of treatment, except as treatment might be required to control the individual teeth during their eruption.

Figure 12 is another case of special interest, as it shows the curious position of the mandible, presenting the unilateral, buccal placement of the lower, the unilateral, lingual development of the upper being increased by the action of the inclined planes. The narrow arch made it impossible for this child to masticate with comfort. The movable mandible was, therefore, shifted for comfort's sake. The only treatment required in this case was the application of the lingual wire, and its progressive manipulation until the result seen on the right was obtained. In this instance satisfactory development of the lower arch took place without the application of an appliance. Permanent centrals may be seen erupted in the upper with ample room on the left and right for the eruption of the lateral incisors.

The next illustration (Fig. 13) shows the occlusal view of the upper arch, and in my judgment shows a correct and harmonious arch development.

I shall now show a case (Fig. 14) similar in its nature to the one just seen—having the same characteristics of the lateral position of the mandible caused by interference. It is my purpose with this one to carry you over a lengthy period of the development, to show the contrast between the early deciduous and the almost completed permanent denture. The various stages of treatment through which this case passed during the transitionary period, were interesting, but cannot be dealt with in this paper in detail. It is sufficient for me to show you the satisfactory arrangement of the permanent teeth, and call your attention to the fact that no further efforts are required except those of nature in

placing the upper left cuspid and lower first bicuspid in normal contact. Exercises which will be described are indicated and practised during closing months of active treatment of this case. It will be interesting for you to know that this development was attained by the application and use of the lingual wire alone.

The next case (Fig. 15) is a sister of the one I have just shown, and its history may be briefly told. The normal development of the arch was obtained by the use of junior pin and tube appliance. The child was under treatment for two winters, and is now under observation during the so far satisfactory and normal eruption of the permanent teeth. The incisors have all appeared, as shown in figure on the right, and no further treatment will be necessary unless individual teeth become misplaced during their eruption.

The next case (Fig. 16) was similarly treated. The appliances are all removed now excepting the lingual wire on the lower. The first bicuspid and cuspids are seen in process of eruption on the right.

Figure 17 is of a child eight years of age, showing its insufficient development of the arches for the accommodation of both the upper and lower incisors. The pin and tube appliance was used with satisfaction on the upper, and the lingual wire accomplished the normal development on the lower. This child is now progressing normally without aid of mechanical interference.

I am glad to show you the development indicated in figure 18. The child was placed under treatment at six and a half years of age. It will be noticed that there was room on the anterior segment of the upper arch for development of the central incisors only. On the lower the lateral incisors had erupted at this period, but were in marked lingual position. The case was treated in the manner described in foregoing cases. On the right is presented a completed permanent denture at thirteen years of age. You will notice the satisfactory bone development and arrangement of the teeth which do not carry with them evidences of orthodontic interference.

The muscular development in this child was satisfactory. She grew, during the process of treatment, into a robust, athletic girl. In the matter of development, utility and beauty of contour,

FIGURE 13

FIGURE 14

FIGURE 15.

FIGURE 16.

this case, as seen in the picture, presents a most satisfactory and inspiring conclusion to the years of treatment.

The type of case here presented (Fig. 19) was one of unusual difficulty. Treatment was commenced the latter part of her eighth year. The model on the right was taken after completion of work, and many months after the removal of all appliances. The pin and tube appliance on the upper arch, lingual wire on lower, with some attachments for accommodation of intermaxillary elastics, were used. It was difficult in this patient to produce sufficient bone development on the upper arch; in fact, the whole maxilla seemed to be deficient on bone growth, and most careful stimulation failed to produce as satisfactory bone development as it is possible to obtain in the matter of occlusion.

Figure 20 is of a child eight and a half years of age, and like one of the preceding slides it represents tardy development. The child was small of stature and mentally active. The junior pin and tube appliance was adjusted to both the upper and lower arches. Figure on the right shows the marked bone development and normal eruption of the incisors. When this point was reached the junior pin and tube appliances were replaced by lingual wires. The next, figure 21, shows the occlusal surface of the lower. You can readily see the work accomplished without the employment of ligatures, or anything but the simplest of appliances. The next slide (Fig. 22) shows the occlusal surface of the upper. The case has now progressed for several years in a perfectly normal direction, and will probably need little or no corrective treatment other than to see that the muscular tone is maintained.

All the illustrations that we have just been reviewing show malocclusions that lead to greater inharmony in later years. Insufficient growth of the bony framework is the obvious cause.

It will suffice, at this time, to recognize that this condition exists, that it can be corrected, and by what means corrections can be effected in the best and easiest way.

Application of Exercises

It has long been taught and generally accepted, that after the teeth have been placed in their normal positions of occlusion, and

maintained for a more or less lengthy period, retention is assured as far as that is possible. This is far from being the truth, because as already stated, unless the surrounding soft tissues are equally normal in development and action the bony structure supporting the teeth will be influenced in some undesirable direction. The muscles of the face must perform their proper function, and in order to do this they must be strengthened. Strong muscles perform their function without fatigue, and accomplish an unusual amount of work without a great deal of mental effort. It is important also that the posture of the child suffering from malocclusion be improved when needed. This is essential in more particulars than one and I am firmly of the belief that we need proper physical balance in all parts of the body to attain and maintain most desirable results. Posture has important bearing on the position of the mandible, and is of immense importance to general health and vigor. My plea for judicious exercises of the muscles of the face is, therefore, founded primarily upon common sense. By disuse, the muscles of the legs fall below their normal in strength, until we are disinclined to use them, and after long disuse we find they will not support even the weight of the body. Yet these muscles are capable of being strengthened to such a degree that they are capable of supporting several times the weight of the body, and are even capable of performing extraordinary feats of strength. They do not shirk at the ordinary duties that are placed upon them when they are strong, but perform them with comfort and efficiency. It is just as true with the muscles of the face as with other groups of muscles. No group has received less attention regarding their proper development than the facial muscles. They have been before us so constantly, and are so intimately connected with the very essentials of our work that it seems strange to me that we have not investigated the means for their development before. It is very true that some of us have thought and expressed ourselves as believing that disuse is largely responsible for malocclusion, but we have been at a loss how to remedy this weakness. Drs. H. K. Hatfield and A. LeRoy Johnson (*Dental Cosmos*, June, 1917) after a series of investigations, have found that the muscular strength of a child suffering from malocclusion is below that found in the normal child.

FIGURE 17.

FIGURE 19.

I have reached the conclusion that the mouth will not perform its full duty until these muscles have been strengthened, and the teeth are in such good occlusion that it requires little or no conscious effort for the masticatory muscles and teeth to perform any task within their function that may be given them. In order to create in you a sense of the possibilities in this direction, we are going to make a brief study of the principal groups of muscles, after which I shall outline a few of the important exercises which I have found valuable in my work.

At the outset let me say that any system of exercises, in its application for the purpose of development of dental arches and facial muscles, must be carefully thought out and adapted to the exact requirements of the case under treatment. The masseter exercises, for instance, should not be applied to a case of malocclusion representing class two until the interference has been removed, or in other words until the arches have been developed to nearly their normal shape and size by mechanical stimulation, nor should the pterygoid exercises be expected to yield satisfactory results until interference has been removed so that the mandible will have some encouragement to settle into its normal position.

Study of Muscle Groups

In our brief study of the various muscle groups we shall take time only to note their attachments and comprehend their principal functions. This will be sufficient, I hope, to make us realize quite fully the value of the suggestions relative to exercises, which I am to give.

The study of the smaller groups of muscles, although much may be said regarding their importance, will have to be postponed until some future opportunity. Their consideration would naturally come under the heading of "Facial Habits and Muscular Balance."

I have already reminded you that posture has an important bearing upon the muscular groups of the face, as well as upon the position of the mandible. Of course, we understand that correct posture (Fig. 23) has primarily its beneficent effect on the general health of the child. Whatever tends to place the child in

a more vigorous and healthy state aids the orthodontist in his work. Children who are suspected of being in need of orthopedic treatment should be recommended to consult the orthopedist for corrective gymnastics. It will not be necessary for me to discuss this matter further, although there is much I should like to say upon this subject. We will turn, at once, to the consideration of the principal muscle groups in which we are concerned, and outline briefly the exercises adapted to each.

Pterygoid

The first group (Fig. 24) I shall select for consideration is the pterygoid group. This figure gives us a clear view of the points of attachment of these important muscles. It will be sufficient, for our present study, to note the relation of the pterygoid fossa and the head of the condyle, and also of the angle of the ramus—the points between which these muscles are stretched.

This illustration (Fig. 25—Gray's Anatomy) shows in a clearer manner the direction taken by these important muscles. They represent the invaluable intermaxillary elastics of nature, which, when properly strengthened by exercise during the process of development of the arches, soon offer us a guarantee of unusual merit for the permanence of our treatment.

The following photograph (Fig. 26) represents a subject much in need of the exercise of these muscles, and is one in which marked improvement has been noticed, as a result of faithful practice. The practice of these exercises is simple, and consists in the act of throwing the mandible straight forward as far as possible, repeating the movement until the muscle group shows slight fatigue. The exercise is practised several times during the day at stated intervals. It is especially valuable in class two cases, and should be commenced a short time before the dental interference has been removed, or when the upper arch has been so changed as to permit the mandible to assume a nearly natural position.

Masseter. Buccinator. Platysma

Figure 27 (Gray's Anatomy) reminds us of the attachment of these and various other groups of muscles. I wish you to note in particular the attachment of the masseter, buccinator and

FIGURE 20.

FIGURE 21.

FIGURE 22

FIGURE 23.

platysma myoides. The exercises of this group of muscles are valuable during the period when the arches are nearing their normal in size and relation, or in any case when the harmony of the arches is such as to give opportunity for development through exercises. The exercise consists of first placing the teeth in their best possible occlusion, and with the mandible held immovable a series of contractions and relaxations of the masseter and temporal muscles are practised until these groups show slight fatigue. These exercises, like the pterygoid exercise, are practised at stated intervals during the day, but are increased each day until the patient is able to do them many times without fatigue. Results in many cases will furnish most satisfactory aid to the orthodontist.

For a more comprehensive idea and study of the muscle groups, the reader is referred to the later editions of Gray's Anatomy. Study should be made of separate groups with a view to studying the separate functions and tracing their interrelation. The study of the platysma myoides and its actions will be found particularly interesting.

Figure 28 gives us the result of these exercises in closing the open bite, after a few weeks of practice by a child nine years of age.

The stretching of the platysma muscles is one that must not be overlooked, especially in cases of class two. The exercises for its benefit are found in combination with the general posture (Fig. 23) exercise, and is here illustrated. The child is directed to look directly above to the zenith, and then accentuating the position by carrying the point of the chin as far above as possible.

It may be claimed by some that little can be accomplished through exercises, because of the operator's inability to secure the faithful coöperation of the patient, but let me say that the art in this lies in making the children actually want to do the work recommended. Much better results can be obtained in this way than by simply telling them to do it. I have found in my experience, that once the child actually realizes the value to be derived that he is quite anxious to coöperate. Those who cannot be so influenced must forego the blessing, but we must be sure the fault does not lie with ourselves.

We must go to primitive man for many physical ideals. He furnishes us with our standard of occlusion and we must not forget that he also furnishes us with other standards of physical development. As a people we have forgotten the importance of the physical, and in our mad efforts to develop the brain, we have neglected all the rest of the wonderful human machine. If we are to succeed in the strenuous battle to come, we must strive in every possible way to develop bodily function to the splendid standard of the perfect man. If we fail in this duty our life shall perish from the earth, and the works of our brain shall be for naught. The dentist in his various specialties is not without opportunity to further the cause of physical fitness, and we will do well if we gain the proper conception of the importance and scope of the field that stretches before us.

Psychological Considerations

The successful practice of orthodontia depends not only upon the treatment of teeth and bone and muscles and the skilful manipulation of appliances, but upon the psychologic knowledge of the operator and the mental condition of the patient. In the whole wide range of corrective treatment there is no department that so requires the coöperation of the patient. This is primarily true because of the length of time required for treatment, and because the success is not dependent upon the more or less certain action of drugs when the patient is under close observation of the practitioner, but upon the development of somatic tissues over a considerable period of time when the patient would be under regular but not constant supervision. This means that for weeks or months at a time the results depend upon the fidelity of the patient to carry out important instructions, and the intelligent coöperation of the patient to see that no injurious habits are formed or harmful developments take place without being reported. The general treatment then is mental as well as physical and neglect of this phase is the cause of many failures.

If this is true in general it is much more true in detailed treatment. The patients are all children or adolescents, and it is a well known fact that children are open to suggestions. *This suggestibility is often detrimental, and the task of the orthodontist*

FIGURE 24

FIGURE 25.

FIGURE 26.

is to make this factor his ally instead of his enemy. All practitioners who have to deal with the teeth know that persons come to them with suggestion working against them. The suggestion is that the patient is to undergo a most painful operation. A large part of the pain suffered by patients in the orthodontist's chair has no organic cause, but is purely mental. The pain caused by the general suggestion of tradition and the particular suggestion of friends is of long duration and severe. It is the fear every second which is the most difficult to endure. As a matter of fact, only the most bungling orthodontist causes pain in its true sense, but it usually requires several treatments with the most skilful suggestion to remove entirely the fear of pain on the part of the patient. The mother with the best of intentions has done the injury, she instructs the child, "Now you must not cry if he hurts you," "You must be a brave boy," etc., so that the child readily takes the suggestion that he is going to a chamber of torture. Counter-suggestions must be made to destroy these.

In general, then, the office rooms should be fitted up so as to be attractive to children—light rooms, bright decorations, furniture comfortable for children. The waiting-rooms should be provided with books for children and youth, and a liberal supply of new and attractive games—so that the children will be delighted to come and loath to leave. The attendants should be instructed that the chief part of their duty is to be pleasant to the children—the whole office force should conspire to make the place attractive. The practitioner himself is the key to the situation in this particular, and must not allow anything to interfere with his good nature.

Two psychological laws for use in dealing with patients may now be stated. They are very simple but fundamental. *The first is that a person cannot think of two things at the same time, the second is that normal suggestion should be indirect and positive rather than direct and negative.* These laws fuse and coalesce in successful practice.

In taking up the first law and its application to our subject, *let us recognize that while the mind may turn rapidly from one thought to another, only one has our attention at a time, and further, if our attention is absorbed by one idea, all other things are*

mentally absent. For our purpose we might speak of our subject as "The Expulsive Power of Another Idea." Let us, for example, take the case of a person sitting in his room suffering most excruciating pain from tooth ache. Someone in the next room cries out "Fire." The sufferer rushes out, aids in extinguishing the fire, talks about the cause and the effects, and at the end of an hour returns to his room to remember that he had had a tooth ache. The ache may return then, or it may be effectively expelled. The patient sits in the chair with mind filled with the thought of being hurt; the skilful practitioner talks of the games in which the child may be interested, the trip up the river, the presents received or expected at Christmas, the child's birthday—anything of a pleasant and absorbing character. With the mind filled with these things there is no room for the thought of pain.

When working about the mouth the suggestion may be such that the experience takes on a new meaning. It takes time and brains, and a certain amount of talent to make most skilful suggestions, but not sufficient attention has been paid to this phase of the work, the practitioner trusting to the inspiration of the moment rather than to preparation for his suggestions, or else ignoring the matter entirely. Remember that if the patient is thinking about your story or his game, his teeth are not paining, and if, as in orthodontia, there is no organic but only mental cause of pain, the pain is more easily removed.

The suggestion should be indirect and positive. *It is better not to mention pain at all.* You may assure the child, "This will not hurt." He may never have thought of hurt, but now that you suggest it he cannot think of anything else. Or, on the other hand, if his former suggestion of pain is very strong even a touch to the teeth may be interpreted as pain, and your statement does not carry weight with him the next time. To say, "This will not hurt" is a direct suggestion and should usually not be used. Instead, say something like this, "A little girl who was here yesterday told me there is no place she likes to be so much as in this chair for she always has such a good time here, she likes to have me work with her teeth and wants to come as soon again as I can have her." The patient makes this his own application. Then the positive suggestion always outlines the new idea. If you tell

Figure 38.

a patient not to think of pain it is practically the same as telling him to think of it.

Not a little malocclusion is caused by bad habits, such as biting a pencil, sucking the thumb, etc. These habits may be so firmly fixed that they can only be cured by abnormal suggestion in the form of hypnotism, but very seldom is this necessary. Usually the active coöperation of the patient and a few skilful and positive suggestions suffice to cure these. Instead of telling a girl that she must not bite her pencil it may be sufficient to call her attention in a casual way to the fact that biting a pencil is a vulgar and dangerous habit because disease germs may be conveyed to the system in that way.

There is practically no branch of the profession so neglected as the psychological, and none that will bring greater returns to study and thought. This is especially true where children are the patients and where injurious suggestions have already been given.

520 Beacon Street, Boston, Mass.

REPORTS OF SOCIETY MEETINGS
FIRST DISTRICT DENTAL SOCIETY OF THE STATE
OF NEW YORK

October 1, 1917.

A regular meeting of the First District Dental Society of the State of New York was held on Monday evening, October 1st, 1917, at the Academy of Medicine, No. 17 West 43rd Street, New York City.

The President, Dr. Charles F. Ash, occupied the chair, and called the meeting to order.

Dr. Frederick B. Noyes, Chicago, Ill., read a paper, entitled "The Mouth in the State of Health."¹

Discussion on Dr. Noyes' address

Dr. Milo Hellman:

It is of considerable gratification to me to be given an opportunity of discussing a lecture delivered by such eminent authority on dental subjects as Dr. Noyes. His extensive studies and profound knowledge of things pertaining to the science of dentistry well entitle him to the esteem of the profession, and I wish to add my quota in the admiration, not only of his knowledge, but also of his personality, as scientist, teacher and friend.

The lecture this evening bears further evidence of Dr. Noyes' keen perception of the processes at work in the completion and perfection of that portion of the human organism constituting the mouth. There is no doubt in my mind that the lesson involved was elaborately, clearly and forcibly expressed and that every one present profited thereby.

There is little to be added and less to be disputed regarding what Dr. Noyes has told us this evening; yet, I would feel that I were shirking my duty were I not to amplify or emphasize to some extent the contentions so ably brought out by him. I shall therefore, refer to one of his "Elements Considered in Determining the State of Health"; namely, *occlusion*.

Occlusion in its broadest sense has a far reaching significance; for, the functions depending upon it namely, mastication,

¹ See Dr. Noyes' address at page 40, present issue of THE JOURNAL,

FIGURE 1.

FIGURE 2.

FIGURE 3.

FIGURE 4.

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respiration and speech, are of biological and anthropological importance. Biological, because by the mastication of food and respiration of air, life is maintained; and anthropological, because by the articulation of speech, the human species is distinguished from the rest of the animal kingdom. In what I shall show you subsequently it will be evident that unless the mouth is in condition to serve efficiently in the performance of these functions, it cannot be regarded as constituting an organ in a complete state of health.

Moreover, since *health* may be defined as that condition, state or degree of bodily soundness as compared with some other state taken as a standard, it necessarily follows that any deviation from this state enters the domain of pathology. Furthermore, following Schwalbe's classification of pathology into *nosology*, the study of disease, and *dyontogeny*, the study of disturbances in development and growth, it is evident that a mouth presenting malocclusion, though its individual tissues be normal, cannot be classed as being in a state of health.

To illustrate, I wish to direct your attention to a case of malocclusion, presented by the casts of a young adult mouth, Fig. 1. The gums were pink and healthy and the teeth—as far as the eye could discern—in excellent condition, there being no cavity and no filling in any of the teeth. The occlusion, as may be seen, is of such character, that the anterior lower teeth are all impinging upon the palate; the mesio-lingual cusps of the upper molars, which should occlude within the central fossae of the lower molars, are occluding in the interproximal spaces of their lower antagonists, thereby reducing the efficiency and the force with which mastication would be performed under normal conditions. The distal half of the lower second molars is out of occlusion, thus reducing considerably the grinding surface of the teeth.

Respiration was interfered with on account of the malrelation of the teeth in the anterior region of the mouth. Under normal conditions the lower lip must rest on the incisal third of the labial surface of the upper incisor, and come in contact with the upper lip, in order that the mouth be closed. The lower lip, instead of resting there, occupied a position between the upper and lower incisors; and as such lip relation cannot be indefinitely maintained, the lips dropped apart, and mouth breathing was the

result. This person was a decided mouth breather. Also, the position of the tongue within the dental arches when the mouth was closed was interfered with by the malrelation of the lower teeth. As the lower incisors impinged upon the palate, posterior to the upper incisors, they reduced the space within the dental arches allotted to the tongue.

Speech was affected in that the sounds of s, z, sh, and x were defective. In the pronunciation of the sound of s, the incisors must be in an edge to edge position; the tongue rests on the floor of the mouth with its tip pointing against the incisal edge of the lower incisor. In the sh sound the same position is maintained excepting the tip of the tongue, which is raised to the roof of the mouth in the region of the first palatine rugae. For the sound of z, the same position of the teeth and tongue is maintained as for s, but the voice is added thereto. It will therefore be apparent how impossible it is in such a case of malocclusion to adjust the teeth in the necessary position for the correct enunciation of these sounds.

Fig. 2 represents another form of malocclusion with the tissues in a healthy condition. Mastication is impaired by the improper relation of the teeth and jaws, and the lack of the upper molars (see Fig. 3) on the right. The anomalous condition of this mouth may be seen in Fig. 3, showing the presence of the deciduous and permanent canines, the diminution in size of the second right premolar and the missing laterals and first and second molars, which never erupted.

Respiration was affected on account of the impossibility of adjusting the lips and tongue properly. Speech was affected in that the sounds of f and v could not be properly pronounced. In the enunciation of these sounds the upper border of the lower lip must touch the incisal edge of the upper incisors. As it is impossible to bring that adjustment about in such cases of malocclusion, the result is that the sounds of f and v are decidedly defective.

Fig. 4 represents a case of malocclusion of a different type; the functions involved were all perverted. Mastication, as may be seen, could not be properly performed, nasal respiration was impossible owing to the lack of room to accommodate the tongue when the mouth was closed; and speech was decidedly affected.

FIGURE 5.

FIGURE 6.

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will call your attention to a few thoughts which have occurred to me. One of these is the fact that orthodontists who have listened to this paper must feel that there are certain requisite attainments which, if they are to be successful practitioners of their specialty, are of paramount importance; for I think the paper of the evening is most timely, and if I were practising orthodontia, I should want to take this paper when it is published and go to a quiet nook and study it over carefully to find out how many of these basic requirements I did not possess, and then strive diligently to improve my ability along those lines.

When we see, as many of us must have seen, lamentable failures after long and arduous periods of orthodontic treatment, we often ask ourselves why there is such a vast difference in the results obtained by some and those obtained by others; and after listening to this paper I think we can more easily answer that question. Few men have been more deeply interested in watching the wonderful strides made by this branch of our profession than I; yet we have only touched upon the borderland of the wonderful blessings to humanity which orthodontia will accomplish in the fulness of time. The muscle exercise as suggested by the essayist is, I think, most important. I was speaking to Dr. Rogers before the meeting, and he mentioned a method of exercising certain of the facial muscles by having his patients use a little bicarbonate of soda in water, and by using the buccinator and other muscles, forcibly driving the liquid back and forth and around the mouth with the teeth closed, using this one mouthful until the muscles become tired, then expectorating, resting a moment, and following it up again in the same way a number of times. This recalled to me that in the treatment of pyorrhea I have suggested the same method,—not for the muscle exercise, of course, but for the forcible driving of a liquid through all the spaces and through the pockets, thus helping to keep the spaces and the pockets clean. It is really wonderful how much force can be developed by constant practice with the mouth filled—not overfilled, but with the proper quantity of liquid.

I have no use for the syringe which Dr. Black suggested, as I find that by insisting upon the patient's practising this use of the muscles the force with which a liquid can be driven through the

spaces and pockets is sufficient to keep them wonderfully clean. One who has never tried it will be surprised by the results, particularly in cases where there is considerable loss of mucous tissue in the interdental spaces.

Normal occlusion and proper contact points, as well as the little grooves which Dr. Ottolengui so graphically explained to us, are most important; and in the treatment of pyorrhea the proper adjustment of contact points and the occlusion are essential to success.

I do not know that I wish to refer to anything else. I have not had the privilege of reading the paper. I simply had the synopsis which was sent to all the members and the essayist has covered the subject so thoroughly there is very little I can add.

Dr. Oscar Carrabine—I should like to speak of the psychological part of Dr. Rogers' most excellent paper, as I believe the profession at large has paid little or no attention to the study of psychology.

For myself, I am convinced there is much in this field of investigation that we ought to know. It seems to me it is of the greatest importance that we should recognize man as a mental as well as a physical being and I shall make a few suggestions that may add something towards gaining a better understanding of this subject.

So much has been written and so many theories have been advanced that one is at a loss to know just how and where to begin, but for those who wish a better understanding of this subject, I would suggest a book written by Thomson Jay Hudson, entitled "The Law of Psychic Phenomena."

Dr. Hudson is, I believe, the first man who classified the human mind. He believed in the dual mind of man; that the line of demarcation between the two was clearly defined; that each was endowed with separate and distinct powers, and he distinguished the two by designating the one as "objective" and the other as "subjective."

The importance of a knowledge of the law of suggestion, its normal application and its effect upon the physical functions and senses of the body, is something that each and every one of us should know.

Dr. Leuman M. Waugh—The paper to which we have listened this evening must be accepted by us as a sincere message based on successful practice. The simple and comparatively delicate appliances, by which the developmental changes have been brought about, is most pleasing. It serves further to prove that the more powerful forms of arch and the use of ligatures, about non-banded teeth, which we formerly employed so generally, can be dispensed with. By this means, it is possible largely to overcome two very objectionable factors, one being the difficulty of cleansing the tooth surfaces about the ligature and the second and probably equally important, the irritation to the gum margin. For, after all, the sub-gingival space should be most carefully guarded in all treatment of the mouth; and the orthodontist should be especially careful not to bring about wounds of the free margin of the gum. I presume the essayist uses the lighter arch wires—about .030, as Dr. Angle recommends, in his pin and tube appliance, and that is probably sufficient to bring about any changes necessary at the proper age for treatment. I believe we must more and more recognize that our purpose can be better served with such appliances as interfere as little as may be with the individual movement of the teeth during treatment.

As to the age at which orthodontic treatment may best be given, although no age was mentioned, many of the slides showed that it was begun early, some at the tender age at which the natural spacing of the deciduous teeth should take place, which is at from three and one-half to six years. The general rule is that treatment should be begun as soon as a deformity becomes sufficiently pronounced to be apparent that Nature cannot correct the condition without aid.

Between the eighth and twelfth year, the greater change normally takes place; and by aiding at a period when Nature is bringing about the greatest developmental change, we are working more in harmony with the physiological forces.

I agree with Dr. Swift when he says that all dental practitioners should be interested in this subject, and I further feel that all of us should really *study* this paper.

The work of the general practitioner and orthodontist should go hand in hand. An orthodontist has the little patient for a few years only, and then the patient is returned to the exclusive

care of the general practitioner, we hope, with teeth in good occlusion and with facial harmony. But as Dr. Ottolengui emphasized, no matter how well the teeth may have been placed in proper position, no matter how carefully the orthodontist has done his work, that nice work may be disturbed most easily by restorations not made upon the principle of normal occlusion harmonized with the conditions present in the mouth at the time. Therefore, by all working in harmony, and criticising each other kindly—and only kindly—may we hope to attain to a higher grade of “all-inclusive” dental service, which must be the ultimate aim of every sincere practitioner whether in general or special practice. And the essay of this evening, if we will study it thoughtfully, should be helpful to this end.

Dr. Rogers (closing discussion)—I am glad that Dr. Ottolengui supplemented my paper by his very timely and interesting suggestions. I think that every orthodontist has recognized the importance of his subject, and is desirous of awakening a sense of duty in this respect among the general practitioners.

I enjoyed the other discussions and appreciate and agree very heartily with what has been said. If any of you should study and undertake the work of muscular development of the facial muscles, you must not become discouraged if you do not get results at once. It is a comparatively new field, and the application of the various exercises must only be made after careful study, and thorough understanding of what is required. Some thoughtless people might prescribe exercises where the conditions present called for some different line of treatment. I believe the orthopedic surgeon will, in the future, prove to be of great benefit to us in our work. In cases not needing his attention, the general posture exercises cannot fail to be beneficial. Parents appreciate their value, and children like to do them. These exercises tone up the whole system and improve the digestive apparatus; and they stimulate greater mental activity. The patient gains greater respect for himself. Children are ready to help, if we are willing to explain the exercise properly. Tell them they will grow vigorous and strong, and few will fail to take interest in the idea.

C. G. FLETCHER, D.M.D.,
Editor, First District Dental Society.

THE JOURNAL OF THE ALLIED DENTAL SOCIETIES

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The Boston and Tufts Dental
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The Metropolitan District of the
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VOL. XIII

NEW YORK, MARCH, 1918

No. 1

EDITORIAL DEPARTMENT

THE INCORPORATION OF THE JOURNAL

At the sixth annual conference, March 3, 1917, of the representatives of the Allied Dental Societies, the publishers of this JOURNAL,—the members of those societies, and guests, the subject of the incorporation of the JOURNAL was discussed in detail. Upon motion, it was resolved unanimously that "we do incorporate,"

* On active duty, Dental Reserve Corps, U. S. A.

and the matter was referred to a committee of five, with power and instructions to proceed to that end.

The meeting was composed of the men who for twelve years have formed a nucleus of enthusiastic workers in the field of professional journalism. Many of those present had given freely in personal effort towards the establishment of a journal which should be in fact as well as name, a mouthpiece for the expression of sincere and earnest thought making for advancement in dental science. Consistent with a policy which aimed at responsible independence in all matters legitimately within its province, THE JOURNAL has advanced on a difficult road, often in collision with the partisans of tradition, who, intrenched in personal loyalty to the leaders of supply-house journalism, resented any protest against the fitness of commercial control of our scientific literature. These painful incidents have been offset by the growth of a circle of friends in all parts of the world, who by act and voice have approved our fundamental contention that dental literature should be produced and owned by the dental profession.

Having served, as it is hoped, some good purpose in professional advancement, it becomes important for THE JOURNAL to improve in every possible way. First and foremost is the need of better organization of those entrusted with the immediate business of publication. With this in view, it was suggested at the conference, that we form THE ASSOCIATION OF THE ALLIED DENTAL SOCIETIES, Incorporated, to be distinct from, but representing the various societies then forming the alliance, and such other societies as may join from time to time, which should consist of active members, directly responsible for the production of THE JOURNAL, and sustaining members, who are willing to help by annual dues, in the support of this enterprise.

Under expert legal advice the committee appointed has taken the necessary steps to comply with the laws of the State of New

York, and a certificate, printed below, was issued by the Secretary of State, incorporating, under the Membership Corporations Law, THE ASSOCIATION OF THE ALLIED DENTAL SOCIETIES.

At the next annual conference, in Boston, April 13th, The Board of Directors, duly authorized by the terms of the Charter, will report on Constitution and By-laws. It is hoped that an effective, harmonious organization will result, which will make for the growth and stability of our JOURNAL.

**CERTIFICATE OF INCORPORATION OF THE ASSO-
CIATION OF THE ALLIED DENTAL
SOCIETIES, INCORPORATED**

We, the undersigned, all being persons of full age and at least two-thirds being citizens of the United States and one or more being residents of the State of New York, for the purpose of forming an association pursuant to the provisions of the Membership Corporations Law of the State of New York, do hereby make, sign, acknowledge and file this certificate:

First. The name of the proposed association is
THE ASSOCIATION OF THE ALLIED DENTAL SO-
CIETIES, INCORPORATED.

Second. The particular object for which the Association is to be formed is the prosecution and encouragement of dental research and the publication of dental knowledge. The official organ of the Association shall be "THE JOURNAL OF THE ALLIED DENTAL SOCIETIES."

The Association shall not engage in any activity for pecuniary profit to be distributed among its members. The Association shall not engage in personal instruction, either oral or by correspondence.

Third. The territory in which the operations of the Association are to be principally conducted is the City of New York, but the Association may have members and distribute its publication in any part of the world.

Fourth. The principal office of the Association is to be located in the City of New York.

Fifth. The number of its directors shall be nineteen.

Sixth. The name and places of residence of the persons to be directors of the Association until its first annual meeting are:

Sebert E. Davenport, 51 West 47th Street, New York City.

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Charles M. Proctor, 419 Boylston Street, Boston, Mass.

William H. Potter, 16 Arlington Street, Boston, Mass.

Seventh. The by-laws of the Association may provide for various classes of members having different rights and privileges.

The by-laws may provide that a prescribed number of the directors shall be elected from nominees of all or any of the following societies:

The First District Dental Society of the State of New York, New York City;

The American Academy of Dental Science, Boston, Mass.;

The Harvard Odontological Society, Boston, Mass.;

The Metropolitan District of the Massachusetts Dental Society, Boston, Mass.;

The Boston and Tufts Dental Alumni Association, Boston, Mass.;

The Dental Society of the State of Massachusetts;
and of such other societies or associations as the Board of Directors may from time to time determine.

In witness whereof the subscribers have made, subscribed, acknowledged and filed this certificate in triplicate this 8th day of October, 1917.

(Signed)

SEBERT E. DAVENPORT,
WILLIAM B. DUNNING,
S. ELLSWORTH DAVENPORT, JR.,
KARL C. SMITH,
FREDERICK C. KEMPLE,
LELAND BARRETT,
CHARLES M. PROCTOR.

[Here follow the individual acknowledgements of above signatures, by legally appointed notaries, also the certification by the Second Deputy Secretary of State that this Certificate of Incorporation is a correct transcript of the original, filed at that office on Nov. 20, 1917.]

CURRENT DENTAL LITERATURE

Compiled by ARTHUR H. MERRITT, D.D.S.

Titles marked with an asterisk (*) are abstracted briefly.

Dental Cosmos, November, 1917.

1. *Chronic Peridental Infections. J. Endelman.
2. *Dental Abscess or Infection and Its Consequences. J. Daland.

1 Chronic Peridental Infections.

The author divides infections of the pericementum into two classes, which he designates "intra-osseous" and "extra-osseous" foci. By the intra-osseous is meant those infections which, by a process of continuity, reach the pericementum by spreading beyond the apical foramina of the roots of teeth, eventually invading the cancellated bone and osseous substance of that region. They are the result of changes which take place in the pericementum following protracted infection by organisms which do not bring about *rapid* tissue destruction. The so-called abscess sac is a strong fibrous capsule composed of proliferations of pre-existing fibers of the pericementum. These sacs, when planted for purposes of inoculation without disturbing the capsule, produced no growth in the artificial media, but when their contents were exposed, luxuriant growths developed, probably explaining why some patients with one or more chronic dento-alveolar abscesses show no systemic involvement. Though such involvement does not occur, it is not because the product of such infections are not in all cases beyond the portals of absorption, but because the individual is able successfully to combat the bacterial invasion. The staphylococcus is the predominating organism in these lesions, though the pneumococcus and typhoid bacillus may be associated with it and bring about same results. Chronic infections beginning at the gingival margin are classed as extra-osseous, which from the standpoint of systemic involvement are of as great, if not greater, importance than those designated "intra-osseous." Report is made of cases of recurrent tubercular activity in which improvement invariably followed treatment directed to the gingiva. It is the author's opinion that these foci are a constant menace to the general health; that they should be eradicated whenever present, even by extraction when they do not respond to treatment within a reasonable time.

2 Dental Abscess or Infection and its Consequences.

It is asserted that after forty years of age, the teeth are the most common seat of the primary focus of infection. These infections may be due to one or more of several organisms, but the streptococcus is the usual cause. Occasionally the staphylococcus is the causative

organism, or may be associated with the streptococcus in the same focus. From the standpoint of virulence, specificity and trophism, streptococci may be arranged as follows: streptococcus hemolyticus, rheumaticus, viridans and mucocis. The virulence of an organism is always more important than the size of the lesion. The primary focus produces not only organisms, but also toxins which play an independent role in causing chronic trauma of various tissues of the body. The belief is expressed that these toxins also possess selective affinities for certain tissues. The most common systemic manifestation of focal infection is polyarthrititis, usually affecting the larger joints. Pyorrhea may cause toxemia, malaise, muscular weakness, anemia or furunculosis, but arthritic cardio-vascular or gall bladder manifestations are less frequent, except in advanced cases. Infected teeth should be promptly extracted when patients show involvement of vital organs. The etiology, diagnosis and treatment of septic foci in the mouth is essentially a dental problem and should be solved by the dental profession, making of it through this added service one of the most important specialties of medicine.

Dental Cosmos, December, 1917.

3 Studies of Internal Secretions in their Relation to the Development and Condition of the Teeth. Wm. J. Gies.

These investigations were undertaken on the assumption that chemical changes may take place in *developing enamel*, through the influence of substances that originate outside of, and enter or affect, the cells involved in the production of enamel. This assumption seems to have been proven correct by the fact that trypan blue when injected intraperitoneally into *young* rats, dogs and rabbits passed freely into the enamel of *developing* teeth, a phenomenon which does not occur in fully erupted teeth. Also, by the fact that strontium, after oral administration daily for some time to young dogs, accumulates in the solid parts of the first and second sets of teeth. It was also found that water and simple mineral salts, such as sodium chlorid, pass freely back and forth through all parts, including enamel, of fully developed natural extracted teeth, indicating that whether or not there is true nutritive or maintenance metabolism in normal enamel, there may be physiological or pathological exchange of materials in enamel by diffusion from blood to oral fluids, and vice versa. In the course of these investigations it was found that teeth contain a *glyco-protein* not unlike the mucoid found in bone: that it remains in teeth during the process of their acid decalcification; that it is extractable from decalcified teeth with diluted alkalies; that it is precipitated from such alkaline extracts by mineral acids; that it is an acid protein forming colloidal salts, and that it yields reducing substance, similar to animated glucose, after acidic hydrolysis. The Author regards the dis-

covery of this hitherto unknown constituent of teeth as the most important single finding in his study of dental problems, making as it does a permanent contribution to dental chemistry.

Dental Cosmos, January, 1918.

4. **The Principles of Black's Cavity Preparation.** R. R. Byrnes.
5. ***The Histological Pathology of Alveolar Abscesses and Diseased Root-Ends.** K. H. Thoma.
6. ***Logical Asepsis in Dental Practice.** J. R. Callahan.

5 The Histological Pathology of Alveolar Abscesses and Root-Ends.

The Author deals at some length with the histo-pathology of both the Acute and Chronic alveolar abscess. The first represents a process of destruction in which the tissue is dissolved into pus caused by a large invasion of pyogenic organisms accompanied by symptoms familiar to all. In contrast to these is the chronic abscess, an infectious granuloma, pathologically placed between pure inflammation and neoplasm. It is not, however, a tumor, or an inflammatory process, but a reaction to a mildly injurious agent, such as organisms of low virulence and small numbers, bacterial toxins and chemical irritants—formaldehyde being an example. The reaction produced is of a purely infectious nature, causing proliferation of the fixed tissue elements with round cell infiltration. The granuloma increases at the expense of the surrounding bone, growing into the medullary spaces, frequently involving the outer cortical layer, and in its simple form is surrounded by a fibrous capsule. It is the extension of this capsule into the medullary spaces which explains why in most cases it remains in the jaw when the tooth, to which it is attached, is extracted. The thickness of this capsule varies greatly and represents nature's effort at limiting the inflammatory process. It does not, however, prevent absorption, as it contains a network of capillaries, and larger vessels establishing direct communication between it and the circulation, as a result of which bacteria and toxins may be carried to the remotest parts of the body. The article treats of the different types of granulomata as distinguished by their histo-pathology; the epitheliated, those showing supuration and necrosis, those with a tendency to cyst formation and those showing various retrograde processes. Regarding the effect of these pathological changes on the root end, it is stated that if the pericementum is destroyed, the cementum easily absorbs the products of infection, and becomes, in consequence, an obnoxious foreign body, which nature tries to eliminate without success. The absorption of the root end which follows is a slow process, starting at the apex, involving the dentin along the dento-cemental junction.

6 Logical Asepsis in Dental Practice.

The statement is made that the best method for sterilizing all dental appliances is flowing steam combined with hot air for drying. In this

way, steel instruments, gutta percha and paper points, napkins, etc., can be sterilized in the most thorough manner, all at one time and in the same sterilizer. The Rochester combination sterilizer, largest size, is recommended, the one run by gas being the more satisfactory. In the discussion Dr. C. F. Ash recommends the autoclave as being most satisfactory as a sterilizer, inasmuch as anything can be sterilized in it and in less time than can be done by the use of flowing steam. He also outlines the sterilizing methods employed in his office.

The Dental Outlook, January, 1918.

7 The Management of Pyorrhea.

P. R. Stillman.

The three main factors to be considered in the treatment of pyorrhea are said by the Author to be Hygiene, Traumatic occlusion and Surgical technic. The importance of each of these is outlined at considerable length. Regarding the technic it is asserted that the instrumentation required in the treatment of pyorrhea is pure surgery, that escharotics or antiseptics should not be introduced in the pockets, as they actually interfere with the healing process. During the period of convalescence, which the Author conservatively places at about six months, all cases should be under careful observation if best results are to be achieved. No case can be regarded as cured unless there is complete obliteration of pockets and reattachment of the gingiva to the root of the tooth.

Dental Summary, January, 1918.

8 Root Canal Problems and Modern Methods of Treatment.

I. L. Furnas.

The method advocated by the Author is having the canal prepared by enlarging it with sulphuric acid until easily accessible, and then filled with the Callahan resin solution, and dry with hot air. Follow this with eucalipta-percha compound, filling canal to end, into which gutta percha cylinders of small size are introduced and packed tightly into canal. If any of the material goes through the foramen, or even the gutta percha filling, no permanent trouble will result if filling material is sterile.

Journal of the American Medical Association, October 20, 1917.

9. *The Menace of Mouth Infections. O. T. Osborne.

10. *Alcresta Ipecac, Report of the Council on Pharmacy and Chemistry.

9 The Menace of Mouth Infections.

Belief is expressed that there is no greater menace to health than crowned and bridged teeth, imperfectly treated dead teeth and pyorrhea, and a plea is made for greater care on the part of physician and dentist in recognizing and treating these conditions of the mouth. The Author's conclusions are that most unexpected tolerance to pyor-

rhea and other mouth infections are found; that as a result of mouth infection chronic invalidism may be caused; that the blood pressure may be raised or lowered; that enlargement of the thyroid may occur, causing hyper or hypo-secretion; that glycosuria, diabetes mellitus, serious disturbances of the blood, heart, kidneys, stomach, intestines, brain and nerves may be caused by infections within the mouth. No treatment of these conditions will avail anything until the mouth is made healthy.

10 Alcresta Ipecac.

The Council calls attention to the claims made for this preparation in its advertising matter, stating that some of them at least are without scientific proof. Attention is called to the statement that ipecac alkaloids have a demonstrated usefulness in pyorrhea. The report states that such unequivocal statements as are made are unwarranted; that in spite of the enthusiastic advocacy of its use as a specific in pyorrhea, the preponderance of scientific evidence indicates that it is of questionable value.

Journal of the American Medical Association, December 29, 1917.

11 Brachial Neuritis and Sciatica.

H. T. Patrick.

The statement is made that neuritis of the brachial and sciatic nerve is rare and is usually confounded with arthritis of the shoulder or hip joint. In neuritis, the pain is constant, is influenced not at all or but little by passive movement, and not greatly by active movement. The disease is usually self limited, lasting a few weeks or months, followed by a definite recovery, and seldom recurs. In arthritis of the shoulder, which is common, the pain fluctuates more or less, and often is not localized in the shoulder joint, but at, or about, the insertion of the deltoid. The striking feature of arthritic cases is that wherever in the vicinity the pain may be located, certain movements of the shoulder joint cause pain with few exceptions; these general symptoms hold good in regard to arthritis of the hip joint. Differential diagnosis may largely be made on whether passive movement of the joint causes pain; if so, it is reasonably certain that the patient is suffering from arthritis rather than neuritis.

New York Medical Journal, December 29, 1917.

12 Novocain to be made in America as Pro-Cain

Editorial.

It is stated that the Federal Trade Commission has issued a license for the manufacture of novocain under the German patent, with the condition that it be designated as Pro-cain, the right to fix the price, if necessary, being reserved by the Commission. Those making use of the drug are advised to make note of the new name: Pro-cain.

New Zealand Dental Journal, November, 1917.

13 The Effect of Organic Acids upon the Teeth. H. P. Pickerill.

After calling attention to the value of organic acids upon the teeth, the Author states that their beneficial effect is due to organic acids plus stimulated saliva. This stimulation with increased salivary flow should continue for a considerable period after the stimulant has been withdrawn, and does so as a rule. The increased water content of this stimulated saliva tends to dilute and wash away any acids formed by the increased alkaline salts poured out per minute, to rapidly neutralize any acids formed as a result of increased ptyalin, and to dissolve any starch adherent to the teeth caused by the increased phosphates and chlorides poured into the mouth. Attention is called to the fact that teeth differ enormously in their resistance, hardness, density, solubility and permeability. This difference is due partly to developmental and partly to acquired conditions, and has to do with the secretions of the ductless and salivary glands, and with the character of the food in early childhood.

Oral Health, November, 1917.

14 Trench Mouth. L. D. Laurin.

A disease very common among troops, the local symptoms of which are putrid sore mouth, swollen ulcerated gums (the ulcers covered by a greyish membrane) and in neglected cases, necrosis of the alveolar process, with loosening of teeth. The general symptoms are malaise prostration, pain in bones, joints, etc. Treatment consists in a well balanced diet, laxatives and the internal administration of Pot. iodidi 1½ drams, Liq. arsenicalis 1 dram, Aqua a. d. 3 ounces. Sig. teaspoonful in water 3 times daily. Fruits are also advocated. Local treatment should include thorough cleansing and scaling of teeth with application to sloughing gums of a solution of equal parts of beechwood creosote and eucalyptol. A mouth wash of two grains of potassium permanganate to a glass of warm water is advised. Note: "Trench Mouth" as described by the Author is probably Vincent infection. This could be determined by bacteriological examination.

NOTES ON DENTAL PRACTICE

COMPILED BY WILLIAM D. TRACY, D.D.S.

Cause of Pyorrhea.—Pyorrhea is a local condition, caused by a local irritant which can be cured by local surgical treatment, thus removing the cause. The irritant is most commonly present at the gingiva of the teeth of those afflicted with the disease, and in fully 90 per cent of the cases presenting themselves in practice. In clinics conducted for the study and treatment of pyorrhea, the cause was found to be rough enamel surfaces and faulty imbrication lines, said abnormalities varying in intensity from a condition only detected by drying the tooth and examining with a strong glass, to enamel as rough as coarse sandpaper, and imbrication lines so jagged as to be easily felt by the tongue of the patient; and in all cases the pocket was deepest on the teeth which were roughest, and shallow or absent on those that were smooth, or nearly smooth, as the case might be. In this respect teeth are like people—there are no two alike—although those teeth which occupy the same relative position on opposite sides of the jaw are nearest to being so.—GEO. R. LINDSAY, *Oral Hygiene*.

Advantages of the Porcelain Jacket Crown.—In placing a porcelain jacket crown we bind the tooth together and have the strength of a Richmond crown without the irritation from a band, because the shoulder joint of the jacket crown does not impinge on the gingivae. The smallest shoulder that can be trimmed is sufficient, as the strength of a jacket crown does not depend on the bulk of porcelain, but on the close adaptation of the jacket crown. In mastication, the force is more nearly equally distributed and the root takes the strain.—HUGH AVARY, *Journal of the N. D. A.*

Oral Sepsis and Arthritis.—Dr. J. Heyward Gibbs, of Columbia, S. C., said that a proper investigation of the gingivae, teeth and alveolar processes must include röntgenographic studies. The important relationship of chronic pyogenic infections to a large group of the arthropathies had been conclusively demonstrated, and the first step in the management of these cases should consist in a systematic search for foci of infection. No one portal of entry for infecting microorganisms should be allowed to obscure the importance of investigating all possible sources of infection.—*N. Y. Medical Journal*.

Influence of Disease upon the Teeth.—In the pursuit of pyorrheal pockets as foci of systemic infection, far too little attention has been paid to the reverse of the picture, that is, the influence of disease elsewhere

upon the mouth of its appendages. Many careful odontologists have insisted upon this point, and have stated as their belief that local trauma and constitutional disturbances or diatheses are necessary to the development of gingivitis, pyorrhea and periapical abscess. The tendency toward diseased teeth in diabetes, arterio-sclerosis, pregnancy and senility is too well known to need repetition, but unquestionably in many other conditions, notably chronic arthritis and chronic cardiopathies, pyorrhea is the effect, not the cause. How many cases can each of you remember, with but a moment's thought, when after the removal of many or all of the teeth for the cure of such chronic diseases, it has finally dawned upon the physician that he has done the patient far more harm than good in removing one of his few remaining sources of comfort, and often it has not only helped the general disease, but has made it decidedly worse by removing one of the prime factors in the normal digestion and assimilation of food.—THOS. R. BROWN, *Journal of the N. D. A.*

Care in Diagnosis and Prognosis.—I believe that our theory, that the presence of virulent organisms in the body can and do produce "more or less" harmful results is a theory based on good scientific understanding, and am quite willing to accept so much of it at this time. I believe that such foci of infection when actually proven to be present should be thoroughly removed, either by therapeutic or surgical methods. I also believe that the ruthless extraction of teeth, the unpardonable lack of ability to correctly diagnose the exact nature of the diseased areas, as to their true infective nature, the rash promises of beneficial results after operative interference, are unscientific and have no place with the thinking mind of a true scientific practitioner of medicine or of dentistry.—H. H. SCHUHMANN, *The Dental Review*.

Caution in Removal of Teeth.—It is quite unjustifiable, especially in chronic diseases of long duration in older people, notably certain of the arthritides, indiscriminately to remove teeth, tonsils, gall-bladder, appendix, or other possible foci of infection. In most of these cases the harm done by the lowered resistance inevitable to the operation is rarely compensated for by the removal of possible focus of infection in the stage of the disease which is presented, and to take away the comfort of chewing or of smelling from these cases, many of whom have already practically lost the power of locomotion, is indeed poor comfort.—THOS. R. BROWN, *Journal of N. D. A.*

The Teeth as the Most Common Seat of the Primary Focus of Infection.—The location of the primary focus of infection may be anywhere, but occurs most frequently in the cavities of the head. After forty years of age the teeth or gums are the most frequent seat of the primary focus of infection. When the primary focus has been removed, a secondary focus, such as the lymph nodes, may become the primary focus, and cause or continue constitutional disease. The best example of a small focal infection is an abscess about the root of a tooth occupying

an area no larger than a split pea. Periapical abscess or infection may be single or multiple, acute, subacute, chronic or latent, and may be modified by symbiosis, remain local, cause systemic disease, or coexist with septic foci in the tonsils or sinuses. Only occasionally is a periapical abscess secondary to a primary focus, at a distance from the root affected, or from other parts of the body: but extension from one root to another by contiguity is frequent. A secondary periapical abscess often affects the roots of otherwise normal teeth; whereas primary periapical infection or abscesses usually occur in teeth previously diseased or devitalized, or by the extension of pyorrheal pockets along the sides of the root. Abscesses or infections about the roots of the teeth frequently exist for months or years before detection, and it is probable that systemic infection occurs intermittently, depending upon varying degrees of natural or acquired susceptibility or immunity, or varying degrees of virulence of the microorganisms.—JUDSON DALAND, *The Dental Cosmos*.

Gunshot Wounds.—The whole character and nature of the wounds, the whole character and nature of military surgery as distinguished from civil practice is determined by infection; one fact that the present war has served to establish, is that all gunshot wounds are infected—all of them. The old dictum that gunshot wounds are sterile unless infected from without, the old theories of the self-sterilization of bullets by heat developed at the moment of impact, have been disproven. All gunshot wounds are infected, bacteriologically. Whether the wounded suffer from the clinical signs of sepsis depends upon the local condition of the wound, the amount of necrosis and hemorrhage, the presence of foreign bodies and dead material and the amount and character of bacterial contamination, and further upon the wounded man's general powers of resistance. But, whether infected clinically or not, all gunshot wounds are bacteriologically infected from the start.—LEO ELOESSER, *Journal of the N. D. A.*

Asepsis in Operating.—I am in favor of opening up and doing the preliminary excavation of all carious cavities without using the rubber dam and washing the loosened infectious decayed material out and into the fountain spittoon, instead of having it in a dry state to be blown all over the operating room. The finishing-up may be done with the dam applied. If we could have a practical sucker instead of a chip blower, it would be a great help to asepsis. Soiled instruments should come only in contact with paper napkins of slight absorbent property or with some sterilizable disk or tray. Have you ever thought what a potent germ carrier the average pens, pencils and appointment books are, especially if one has used them when there were smears of saliva on the hands?—GEO. BROWN, *Items of Interest*.

A Summary of Conclusions in Regard to the Use of the X-Ray.—

(1) In the light of present knowledge, the unrestricted use of roentgenograms is essential to honest dentistry.

(2) That efficient and safe radiodontic equipment is now so compact

and the technic so simplified that any dentist may, with but little special preparation, make satisfactory roentgenographic exposures in the dental chair regularly used in the operating room.

(3) (a) That roentgenograms best meeting the needs of a given case can be made by the dentist treating that case, because of his intimate knowledge of conditions and requirements. (b) That the principles of interpretation are not difficult to understand, and that correct decision in a majority of cases depends largely on an intimate knowledge of the clinical history, which can best be known to the dentist treating the case; therefore he is in possession of the knowledge essential to the most intelligent diagnosis.

(4) (a) That in pulp cavity treatment a minimum of three pictures should be made. The first, before beginning treatment, as means of diagnosis; the second, showing wires placed fully to the end of the root; the third, showing the filling material properly placed. Many intervening exposures are often necessary. (b) That roentgenograms made at intervals of from two weeks to several months are frequently necessary for post-operative observation of doubtful cases. As the years pass they should also be made whenever local or systemic symptoms arise.

(5) That it is consistent with professional dignity and conducive to greater efficiency to include the necessary roentgenograms as a part of dental service.—L. M. WAUGH, *Dental Cosmos*.

Injuries of the Face and Jaw.—Injuries of the face and jaw are not to be counted among the gravest of war, but there are none that better reward proper treatment and none that more heavily avenge neglect. If the face is allowed to collapse, and the defects in the chin to shrink, the resulting deformity is most difficult to correct; ankylosis of the jaws, retreating chins, misshapen dentures are concomitant conditions.—LEO ELOESSER, *Journal of the N. D. A.*

Intra-Osseus Anesthesia.—The tissues surrounding the tooth having been as well sterilized as possible, a small quantity of the anesthetic was injected into the gum, well up under the lip and distally to the root of the tooth. The outer plate of the process was then perforated with a number one-half round bur, and the anesthetic was then injected through this perforation into the cancellous tissue surrounding the root by means of a conical needle, with which the ordinary hypodermic needle had been replaced, its conical shape causing it to bind in the opening made by the bur, thus preventing the leakage of the anesthetic. Ten or twelve drops were injected, when it was found possible to remove the vital portion of the pulp without pain.—FRANK L. PLATT (Clinical Demonstrations), *Dental Items of Interest*.

Multiple Foramina.—With regard to multiple foramina at the apex, it remains to be proved that any real pulp tissue passes out of more than one or two foramina close to the end of the root. I have seen cases where

the clinical picture seems to indicate that the pulp tissue occupies those foramina. Just so long as the external orifices of the multiple foramina are covered with healthy pericementum, forget it—don't worry about it; but when it is absolutely uncovered, the probability is that you cannot save the tooth unless you resort to amputation. Occasionally some of these multiple foramina are quite large, and where they are, we seem to be able to cleanse them chemically with the sodium and potassium treatment. Many of these canals which do not appear before they are filled, become exceedingly apparent when they are filled.—R. OTTOLENGUI, *Dental Cosmos*.

OUR ARMY AND NAVY

COMPILED BY LELAND BARRETT, D.D.S.

Recent decisions of some importance:

MEMBERS OF RESERVE CORPS ON INACTIVE LIST MUST NOT WEAR UNIFORM

A Dental Reserve Corps Officer not on duty should comply with the following order for the reason that he is in danger not only of severe censure but of being called before a board for trial. Somebody will lose his commission some day if the Reserve Corps officer insists upon wearing his uniform while off duty.

UNIFORM I: RIGHT OF RESERVE OFFICERS TO WEAR

A reserve officer not called into active duty is not authorized to wear the uniform of the United States Army.

(Ops. J. A. G. 96-140, Oct. 30, 1917.) Bulletin 67, page 15.

* * *

C. F. B.—An officer of the Regular Army outranks officers of the same grade in the National Army or National Guard or Reserve Corps. Relative rank between officers of the same grade of the National Army, National Guard and Reserves is determined, first, by date of commission and, when of the same date of commission, then by length of prior service in Army, Navy or Marine Corps.

* * *

ARMY SURGICAL CASE TRIAL

The War Department authorities have pronounced as irregular and void the proceedings of a court martial convened at Camp Shelby, Miss., for the trial of an enlisted man of Company G, 150th infantry, convicted for refusal to undergo a surgical operation prescribed by Major James E. Baylis, the examining surgeon. The accused was found guilty and sentenced to confinement for two months, which sentence was approved, but was suspended by reviewing authority. The War Department takes the position that in order to charge a crime under G. O. 43, War Department, it must appear in the specification that the examining surgeon not only prescribed the operation, but certified that it was without risk to the life of the soldier and was necessary for the removal of a disability that prevented the full performance of any and all military duties that properly can be required of the soldier. It is held that the specifications in this case did not charge a crime against any military law or regulation, and this is in the line of numerous opinions of the judge advocate general's office in similar cases.

SOME LESSONS FROM THE DRAFT EXAMINATIONS

About teeth there can be no dispute. Mouth infection is a menace to health, and missing teeth indicate probable past impairment. A young man who has lost so many teeth that he is not eligible for military service, on that ground alone should be an object of concern to the community. Grave conditions of mouth infection are liable to develop into actual organic disease.

There should be a center of information in each community to which the registrant can turn for information and guidance as to channels of relief. Physicians, dentists, hospitals, the United States Public Health Service, and health departments all stand ready to render some form of relief without charge to those of moderate means. The man who can pay to have himself made fit should do so. What is needed is an organized machinery to bring the registrant to the source of relief.

Many have doubted that much could be accomplished in this class until a law is passed making reclamation by medical treatment or operation compulsory. This is repugnant to our ideals of personal liberty, and yet it is not as chimerical a plan as many would suppose.¹

PHYSICAL REFORM

The enlisted soldier is subject to court martial if he refuses an operation that would make him fit for service. The registrant is really in the service; and once at the cantonment or reconstruction hospital, the majority, needing operation, would no doubt consent. This, I understand, is the case in England.

Let us remember that 30 per cent. of this substandard condition is preventable; that 30 per cent. is due to poor general physical condition remediable by proper nutrition and physical training and personal hygiene; that 30 per cent. is due to defective eyes and bad mouth conditions, and that 10 per cent. is due to neglected surgery.

EUGENE LYMAN FISK.

* * *

Paris, Nov. 29, 1917.

RENEWAL OF DENTAL PROSTHESES

M. Justin Godart, undersecretary of state for the military medical department, has issued an order by which all aids to mastication (plates, bridges, etc.) furnished to soldiers of all classes to relieve them of digestive disturbances, or which they will use during their enlistment in the army or auxiliary service, will be so furnished only during the period of enlistment. But, soldiers who have sustained injuries of the jaws or teeth while in service shall be considered as "*mutilés de guerre*" (war mutilated) and will have the right to renew their prosthesis during their lifetime.

Journal of the A. M. A.

¹ See preceding article bearing on this point.

DENTAL CORPS PROMOTIONS

Under provisions of an act of October 6, 1917, advancement in rank of following dental surgeons is announced:

To be colonels, with rank from October 6, 1917.—Robert T. Oliver, S. Davis Boak, Franklin F. Wing, George L. Mason, Frank H. Wolven, John H. Hess, William H. Chambers, Alden Carpenter, Edwin P. Tignor, John A. McAllister, Jr., George H. Casady, Julien R. Bernhelm.

To be lieutenant colonels, with rank from Oct. 6, 1917.—Rex H. Rhoades, George E. Stallman, George I. Gunckel, Frank P. Stone, Raymond E. Ingalls, Harold O. Scott, John R. Ames, Robert H. Mills, Frank L. K. Laflamme, Minot E. Scott, George D. Graham, Robert F. Patterson, Samuel H. Leslie, Albert R. White, Mortimer Sanderson, John H. Snapp, Wm. A. Squires, Arnett P. Matthews, John W. Scovel, Charles DeW. Deyton.

To be majors, with rank from Oct. 6, 1917.—Benj. C. Warfield, Herman S. Rush, Lester C. Ogg, Harry M. Delber, Lowell B. Wright, Walter L. Ressenman, James G. Morningstar, Eugene Milburn, Claudius G. Baker, Samuel J. Randall, Charles Taintor, Don G. Moore, Oscar G. Skelton, Harlan L. Thompson, Robt. B. Tobias, Harry C. Peavey, Wm. S. Rice, Emmett P. Varvel, J. Craig King, Leigh C. Fairbank, Charles C. Mann, Richard B. Clark, Dale E. Repp, Terry P. Bull, Raymond W. Pearson, A. J. Skillman, Donald W. Forbes, James L. P. Irwin, Thomas C. Daniels, Ben H. Sherrard, Frederick R. Wunderlich, Wilfurth Hellman, Bruce H. Roberts, Samuel Kaufman, Lee S. Fountain, John L. Schock, Charles W. Lewis, Gerald D. Byrne, E. Henry Valentine, Oscar P. Snyder, Wm. Mann, Joseph H. Tyler, Rex McK. McDowell, Charles M. Taylor, Thomas L. Smith, Elbert E. Rushing, Earp T. Dickmann, Walter S. Smith, Brantley I. Newsom, George R. Tressel, Lee B. Schrader, Frederic H. Bockoven, Aaron F. Eidenmiller, Howard I. Benedict.

RESERVE DENTAL CORPS PROMOTIONS

Now that these preliminary arrangements for advancement of members of the regular corps are out of the way, the matter of promotion in the Dental Reserve Corps has been taken up, and the Surgeon General has directed chief surgeons of divisions and departments and of the troops in France to make recommendations as to those reserve dentists of their organizations whom they consider merit advancement in rank. For the present no dental reservist will be considered for promotion unless he has been in the actual practice of dentistry for at least three years, and later, none of less experience will be considered until after completion of one year's service in the military establishment during the present war. Moreover, dental reservists not on active duty will not be considered for promotion. The Dental Reserve Corps will have the same grades as the Medical Reserve Corps—that is, the personnel will be distributed among the grades of major, captain, and first lieutenant—those on active duty being distributed in the grades in the same proportion as in the medical branch. Thus, not more than about 32 per cent. may be in the grade of major and the remainder in the grades of captain and first lieutenant, but it is not intended completely to fill the grade of major immediately. Accordingly, of the 1,500 dental reservists on active duty, not more than about 484 of them may be advanced to the grade of major.

Army and Navy Register.

* * *

ARMY DENTAL CORPS ITEMS

Five of the candidates who took the examination for commission in the regular Dental Corps of the Army have been reported as qualified. This represents those candidates who could not be appointed because of

the age limit if there was any further delay, so they are being commissioned in advance of the others who were examined at the same time and upon whose qualifications a report will be made later. These officers have been nominated as first lieutenants of the Army Dental Corps and were confirmed just before the adjournment of the Senate for the holiday recess. Those who are to be commissioned on account of the possibility of age disqualification are Lieutenants John L. Richards, Winfred E. Henshaw, Joseph E. Schaefer, George J. Sibley, and Frank P. K. Barker.

NEW ARMY DENTAL SURGEONS

Jan. 12, 1918

The following-named applicants for appointment in the Dental Corps of the Army, having passed the required examination, their commissions as first lieutenant in that corps in the following order are recommended:

John Godfrey Urban, 1st lieut., D. R. C., Schofield Barracks, H. T., Hawaiian Islands.
 Carl Stevenson Emmett; 1004 Hume Mansur, Indianapolis, Ind.
 William Henry Siefert, 1st lieut., D. R. C.; Fort Omaha, Neb.
 Samuel J. Lewis, Kalamazoo, Mich.
 James Henry O'Reilly, 1st lieut., D. R. C.; Fort Sam Houston, Texas.
 Frederick Werner Miller, Kansas City, Mo.
 James Alfred Curtis, jr., Atlanta, Ga.
 James Jay Weeks, 1st lieut., D. R. C.; Camp Cody, Deming, N. Mex.
 John Nelson White, Green, Ky.
 Homer Lash Sams, 1st lieut., D. R. C.; Presidio of San Francisco, Cal.
 George Magner Krough, 1st lieut., D. C. of N. G.; Camp Cody, Deming, N. Mex.
 Wayne W. Woolley, 1st lieut., D. R. C.; Camp Cody, Deming, N. Mex.
 Edward Wallace Barr, 1st lieut., D. R. C.; 8th F. A., 1st Div., A. E. F.
 Fernando Emilio Rodriguez, 1st lieut., D. R. C.; Camp Upton, N. Y.
 John Leigh Davis, 1st lieut., D. R. C.; Camp Upton, N. Y.
 Joseph Henry Jaffer, 1st lieut., D. R. C.; Camp Green, Charlotte, N. C.
 Adolph August Meyer, Stockton, Cal.
 Howard Clayton Feyler, 1st lieut., D. R. C.; Columbus Barracks, Ohio.
 William Ferdinand Scheumann, Fort Wayne, Ind.
 Alonzo Gooch McCue, jr., 1st lieut., D. R. C.; Hdqrs. 28th Inf., 1st Div., A. E. F.
 Campbell Hopson Glascock, St. Louis, Mo.
 Austin Freeman Roberts, 1st lieut., D. R. C.; Fort McDowell, Angel Island, Cal.
 William Frederick Wieck, Angleton, Texas.
 Thomas Herbert Veale, Quincy, Mass.
 Lawrence Joseph Dunn, 1st lieut., D. R. C.; New York city.
 Carl Reuben Oman, Seattle, Wash.
 Leslie Albert Gould, 1st lieut., D. R. C.; Camp Upton, N. Y.
 Harold Avery Curtis, Waverly, N. Y.

DENTAL CORPS

Jan. 19, 1918

1st Lieut. William A. Moore from duty at Fort Riley to Fort Bliss, Tex., for duty with 18th field artillery.

1st Lieut. Charles H. Brammell from duty at Fort Riley to Douglas, Ariz., 10th field artillery, for duty.

The following from duty in Panama Canal Department to United States and report for orders: 1st Lieuts. Charles C. Mann and A. J. Skillman.

The following from duty at Camp Lewis, Wash., to San Francisco, Cal., to Philippine Islands for duty. 1st Lieuts. John C. Campbell and Leland S. Wilson.

1st Lieut. Milton A. Price from present duties and assigned with aviation section, Greenville, S. C., Camp Sevier.

DENTAL CORPS.

Jan. 22, 1918.

1st Lieut. Walter D. Vail to St. Louis School of Plastic and Oral Surgery, Washington University, for instruction and return to station.

DENTAL RESERVE CORPS.

1st Lieut. Daniel S. Lockwood to Camp Meade, Md., for duty.

1st Lieut. William H. Delbridge, Jr., to Deming, N. M., Camp Cody, for duty.

1st Lieut. Harold J. McGinn to Garden City, N. Y., concentration camp and supply depot, for duty.

1st Lieut. William M. Kester to Wrightstown, N. J., Camp Dix, for duty.
The following to St. Louis, School of Plastic and Oral Surgery, Washington University, for instruction: 1st Lieuts. Ernest E. Buell, Clarence S. DeLong, Edward F. Lefitte, Edward B. Lodge, Walter Sorenson, Pearly M. Fugler, John A. Robinson, and Charles F. Pickering.

DENTAL RESERVE CORPS.

Feb. 12, 1918.

To be first lieutenants.—Edward Joseph Ortion, Ralph S. Davenport, Richard Hingston Burkhart, Francis Correll Bartleman, Dean Elbert Ihde, Ewing Bradley Connell, Garold Bosworth Jensen, and Joseph Levenson.

DENTAL CORPS.

Feb. 16, 1918.

1st Lieut. Glover Johns from duty at Camp MacArthur, Tex., to Fort Sam Houston for duty.

1st Lieut. Joseph H. Schaefer from duty at Camp Meade, Md., to surgeon general's office for temporary duty.

The following to Philadelphia, School of Plastic and Oral Surgery, Evans Dental Institute, for instruction and return to proper station: 1st Lieuts. Wm. J. R. Akeroyd, Frederick C. Daniels and Julius L. Bischof.

The following upon arrival in United States to Washington for examination for promotion: Majs. Charles C. Mann and Arthur J. Skillman, and Maj. Mann to Columbus Barracks for duty and Maj. Skillman to Camp Upton, N. Y., 77th division, for duty.—*Army and Navy Register*.

* * *

ENROLLING MEDICAL AND DENTAL STUDENTS

About one thousand medical and dental students were enrolled in the Naval Hospital Corps Reserve during the week ending December 15, when the new selective-draft regulations went into effect. These young men, of whom about two-thirds were medical students and one-third dental students, were enrolled as hospital apprentices, first class, in an inactive status and permitted to continue their studies. It is planned to assign them to duty during their vacation period, where they will acquire practical knowledge and experience. The enrollment of this large class of students solves, for the present at least, the problem of supplying the Navy with available material for medical and dental officers. Under the new draft regulations medical and dental students could only be exempted provided they enrolled in the Medical Reserve Corps, and consequently those students who preferred service in the Navy took advantage of the opportunity of enrolling in the Naval Hospital Corps before it was too late.

NAVY NEEDS NO MORE DENTAL STUDENTS

Enrollments of dental students in the naval hospital corps reserve have been suspended, a sufficient number of embryo dentists having been obtained to meet the Navy's needs for the present. About three hundred students of this class were enrolled. Enrollments of medical students will continue indefinitely under the same conditions as enrollments have been conducted for the reserve during the past few months. The regular Hospital Corps of the Navy is filled to its legal capacity, but with the increase in the enlisted personnel which has been recommended by Secretary Daniels, there will be an automatic increase in the complement of the Hospital Corps, bringing the strength up to over 9,000, and active enlist-

ments will be resumed. The Hospital Corps has proven very popular since the legislation of 1916 putting the corps on the same basis as other branches of the Navy, and transfers in increasing numbers are being made from other branches of the Navy and of the Marine Corps.

EXAMINATION FOR NAVAL DENTAL CORPS

A board has been in session in Washington for the past two weeks for the examination of candidates for appointment as dental surgeons in the Navy. The examination started with 37 candidates, some of whom failed to qualify physically. Five candidates passed a successful examination and will be commissioned. There are sixteen vacancies in all, and it is expected that another examination will be held in the near future to fill the 11 remaining vacancies. Surgeon H. L. Dollard is president of the examining board.

Army and Navy Register.

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PROPOSED LEGISLATION FOR NAVAL DENTAL CORPS

BY HOMER C. BROWN, D.D.S., Columbus, Ohio, Chairman, Legislative Committee, National Dental Association

The National Dental Association, at the New York meeting, approved legislation placing the Naval Dental Corps on an equal status with the Naval Medical Corps, similar to the conditions existing between these two corps in the Army, as enacted by Congress, October 6, 1917. The Legislative Committee was instructed to promote this approved legislation.

Therefore, the following bill was introduced January 5, 1918, by Senator Lodge:

83386—A BILL

To provide for commissioned officers of the Dental Corps of the Navy the same rank, pay, promotions, and allowances of officers of corresponding grades in the Naval Medical Corps, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That the Dental Corps of the Navy shall consist of commissioned officers of the same grades and proportionally distributed among such grades, as are now or may be hereafter provided by law for the Medical Corps, who shall have the rank, pay, promotions, and allowances of officers of corresponding grades in the Medical Corps, including the right to retirement as in the case of other officers, and there shall be one dental officer for every thousand of the total strength of the Navy and Marine Corps authorized from time to time by law: Provided, That dental examining boards shall consist of one officer of the Medical Corps and two officers of the Dental Corps: Provided further, That immediately following the approval of this Act all members of the Dental Corps now in active service shall be re-commissioned in the Dental Corps in the grades herein authorized in the order of their seniority and without loss of pay, rank, allowances, or precedence in the Navy: And provided further, That nothing in this Act shall be construed as in any way affecting the original appointment of officers to the Dental Corps as provided in the "Act approved August twenty-ninth, nineteen hundred and sixteen, making appropriations for the naval service for the fiscal year ending June thirtieth, nineteen hundred and seventeen, and for other purposes": And provided further, That when ordered to active duty officers of the Dental Reserve Corps shall receive promotion in rank under the same relative conditions and provisions of active service as is provided in this Act for the Navy Dental Corps.

It should be distinctly understood that this legislation is entitled to and should receive the liberal support of the profession generally.

To that end we especially and respectfully request that THE OFFICERS OF ALL DENTAL SOCIETIES PROMPTLY WRITE THEIR SENATORS AND REPRESENTATIVES ENDORSING THIS LEGISLATION AND SOLICITING THEIR SUPPORT OF SAME. It is assumed that all dental societies, at some time have endorsed this general legislative program and it is therefore suggested that official stationery be used in writing and that you be specific in stating that you express the views of your society. Individual letters are very necessary, especially from those who professionally serve or are acquainted with their Senators and Representatives, and further, it is very important that the merits of this legislation be most favorably presented to the members of both the Senate and House Naval Affairs Committees, as committee support is an essential requisite. In these letters, it can very properly be stated that this proposed legislation is in exact harmony with what was enacted by Congress, October 6, 1917, for the Army Dental Corps and, as a question of justice, the same condition should be provided for the two branches of the service.

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"THE DENTAL RESERVE CORPS"

The following is an editorial from *The Military Surgeon* and has to do with the dentist in the army

The Military Surgeon feels assured that the members of the dental specialty now being called upon for service in the Dental Reserve Corps, will freely and willingly meet all the conditions which such service demands. We are informed that the national association has taken the necessary action to obtain a census of the dentists throughout the country, and is already in position to furnish the authorities with the available information and statistics.

On a basis of one dentist per thousand of strength, at least 1,500 will be required almost immediately and not less than an equal number more in reserve for emergency, which will surely soon arise. There are in the United States 40,000 dentists, half of whom are probably available for military service, though there is little likelihood of any such being required by the forces; nor indeed could they be spared by the civil population. No one can question the importance to the community of skilled dental aid, and this is becoming more and more appreciated in the military service. It would seem that the medical profession generally and the dental specialists themselves are now more fully realizing how important the mouth and its appendages are in the economy of the body.

Such being the case, the dental specialty, the acquirement of a knowledge of which has each year recently demanded higher attainment, is becoming to be recognized as of far greater importance than formerly, in maintaining the health of the people. Finally, the wonderful prosthetic

work its practitioners have accomplished thus far in treating war injuries, and the larger field which is opening to them in this direction, will soon place the dental surgeon on a par with other special surgeons, if such is not already the case.

Members of the dental corps of the medical departments of our army and navy are now duly commissioned officers, entitled to all the rights and privileges attached to a commission and the Association of Military Surgeons will at its coming meeting consider an amendment to the constitution to include in eligibility to its membership, the officers of the Dental and Dental Reserve Corps.

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DENTISTS ON DRAFT BOARD

The American Dentist has recently published lists of dentists who have been appointed on the Draft Boards of the following states and districts therein: New Jersey, Ohio, West Virginia, and Wisconsin.

Dentists are now being appointed to the Medical Advisory Boards, and to the Local Exemption Boards of New York City and vicinity. We are informed that the same procedure will, so far as possible, be followed in all other states.

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ARMY DENTAL CORPS

One of the branches of the Army in which there has been a marked increase—something over 1,744 per cent.—is that of the dental personnel. When this country entered the war, the Army had only 86 dental officers who were members of the dental corps, of whom 19 were captains and the remainder first lieutenants, and it was necessary to provide an almost entirely new dental personnel to take care of the greatly expanded military establishment. Up to December 15, 1,500 dental officers actually were on duty, of whom 178 belong to the Dental Corps of the Regular Army, 227 to the Dental Corps of the National Guard and the remainder to the Dental Reserve Corps, this being the number required for an army of 1,500,000 men on the basis of one dental officer to every 1,000 men, as prescribed for the Regular Army. Moreover, enough additional dentists have been commissioned in the Dental Reserve Corps, but not placed on active duty, to provide, with those already on duty, a dental personnel for 5,000,000. Owing to enrollment of dentists in sufficient numbers to take care of all anticipated needs, the issue of further commissions was suspended on September 18, except where men of well-known attainments were required for special duties, and enrollment of the latter class was suspended on December 15. In carrying on the general dental work of the Army, dental surgeons are organized into units, for each of which a dental infirmary is provided. While not permanently assigned to any definite organization, a dental unit ordinarily serves a brigade, with such additional organizations as may be conveniently assigned. Each unit operates under

an assistant dental surgeon, selected by the chief dental surgeon of the camp. All dental officers are under the immediate control of the dental surgeon, who in turn is under supervision of the division surgeon. Ordinarily, one assistant dental surgeon and ten operating dental surgeons are assigned to each dental unit. The dental division of the office of the Surgeon General of the Army is in charge of Major William H. G. Logan, Medical Reserve Corps, of Chicago, one of the foremost dental surgeons of the country. He is president of the National Dental Association and chairman of the dental committee of the general medical board of the Council of National Defense.

Army and Navy Register.

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MEDICAL RESERVE CORPS: Total recommendations, 17,645; declinations recorded, 1,233; discharges, 218; acceptances, 535 majors, 2,291 captains, 11,141 lieutenants; total acceptances, 14,237 (leaving nearly 2,000 recommendations not acted upon and nearly 2,000 commissioned but not yet assigned to duty).

DENTAL RESERVE CORPS: Total recommendations, 4,696; declinations, 32; discharges, 3; acceptances, 3,919. (The comparison is, unfortunately, to the detriment of the medical profession.—*Buffalo Medical Journal*.)

STRENGTH OF THE MEDICAL CORPS AND MEDICAL RESERVE CORPS OF THE ARMY

On February 1 the Medical Corps had a total strength of 773 officers, 1 major-general, 66 colonels, 111 lieutenant-colonels, 215 majors, 2 captains and 378 lieutenants.

There have been recommended for appointment in the Medical Reserve Corps 21,300, the total number in the corps on that date being 16,637: 919 majors, 3,595 captains and 12,123 lieutenants. There were on active duty 13,097 officers of the Medical Reserve Corps, including 808 majors, 2,968 captains and 9,321 lieutenants.

The Medical Corps of the National Guard in the federal service totaled 1,178, including 7 lieutenant-colonels, 250 majors, 147 captains and 774 lieutenants.

The Medical Corps of the National Army includes 4 brigadier-generals, 3 colonels, 3 lieutenant-colonels and 2 majors.

There are in all 18,600 commissioned medical officers, of whom 15,060 are on active duty. This does not include the Dental Corps, the Dental Reserve Corps or the Dental Corps of the National Guard, which contain 211, 4,749 and 260 officers, respectively. In addition to these departments, the Veterinary Corps, the Veterinary Reserve Corps, the Veterinary Corps of the National Guard and the National Army contain 25, 1,338, 57 and 283 officers, respectively; the Sanitary Corps, 722 officers, and the ambulance service, 135 officers.

Army and Navy Register,

CURRENT NEWS

Items of professional news, of general interest, will be welcomed by Dr. Leland Barrett, at 220 West Ninety-eighth Street, New York City.

Have you completed your income tax return yet? If unmarried and your net income exceeds \$1,000, or if married, your net income, including that of your wife, is taxable if it exceeds \$2,000.

Blank forms may be secured from the Collector of Internal Revenue of your district, if not already received by you, and should be returned by you properly filled out, not later than March 1st, 1918, to avoid the penalty of \$20 to \$1,000, together with an additional tax of 50 per cent.

A fraudulent return with intent to evade proper payment of tax is punishable by an additional tax of 100 per cent, a fine of \$2,000 or one year's imprisonment, or both.

For each dependent minor child, an additional exemption of \$200 is allowed. For example, if your family consists of yourself, wife and three minor children, you are exempt up to \$2,600.

The proceeds of life insurance policies paid to individual beneficiaries upon the death of the insured, is exempt. Also the value of property acquired by gift, bequest, devise or descent. It must be understood, however, that the income derived from such property is taxable.

In making out your return of net income for the year, all legitimate expenses are allowed, including dues to dental societies, subscriptions to dental journals, the expense of attending dental conventions, the rent paid for office rooms and the hire of office assistants, the cost of fuel, light, water, telephone, etc. If your office is located in your residence, the proportion of rent paid which is properly chargeable to the number of rooms so used may be claimed as a deduction.

Amounts expended for books, instruments and furniture of office of a permanent character are not allowable as deductions. These items are held to be investments of capital upon which depreciation may be claimed. Personal contributions and gifts to chartered religious, charitable and scientific organizations are exempt if not in excess of fifteen per cent of net income.

If your net income is in excess of \$6,000 you are subject to an excess profit tax of eight per cent in addition to the regular income tax.

New rulings and amendments may materially modify these requirements and you are advised to consult your banker, postmaster, or Collector of Internal Revenue as to these points before making out your income tax return.

Later:—The time for making returns in connection with the income tax for the year 1917 has been extended to April 1, 1918. This was

found necessary on account of the great delay in interpreting the law by Treasury Department experts.

Attend to this *now*; it is your patriotic duty.

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The National Board of Medical Examiners will meet at Cornell University Medical College and frame higher standards of examination for admission to the medical profession, and at the same time make it possible for successful candidates to practise in any part of the country without being compelled to take State examinations.

Legislation recognizing the sanction of the board has been enacted in fourteen States and twelve others await formal enactment of similar laws affecting examination for licenses. These are intended for private practice, but successful candidates will have the advantage of the board's sanction should they desire to serve in the army or navy.

The board comprises Rear Admiral J. C. Braisted, U. S. N., Chairman; Surgeon General W. C. Gorgas, U. S. A.; Medical Director E. R. Stitt, U. S. N.; Surgeon General Rupert Blue, United States Public Health Service; Assistant Surgeon General W. Rucker, of the same service; Col. Louis A. La Garde, Major Isadore Dyer, Major H. D. Arnold, Major Victor Vaughan, Dr. Henry Sewall, Dr. Herbert Harlan, Dr. E. Wyllys Andrews, Dr. L. L. Wilson, Dr. Walter L. Bierring and Capt. J. S. Rodman, Secretary of the Board.—*New York World*, January 9, 1918.

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The dedication of the new dental building of the College of Dentistry, State University of Iowa, took place February 22d, at Iowa City, Iowa.

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In an article in a recent issue of *The Saturday Evening Post*, Dr. W. W. Keen, emeritus professor of surgery of the Jefferson Medical College of New York, reveals for the first time the facts connected with the surgical operation performed on President Cleveland on July 1, 1893. It will be recalled that the publication of rumors of such an operation led to animated controversy and to official denial from Washington. The operation was performed only a few days before Congress met in special session to hear Mr. Cleveland's message urging the repeal of the Sherman Act, and Dr. Keen explains that the reticence regarding Mr. Cleveland's condition was due to the gravity of the financial situation and the belief that it would affect his plans respecting the repeal of this measure.

The operation was performed on board the yacht Oneida, belonging to Commodore E. C. Benedict. Dr. Keen thus describes its extent: "The entire left jaw was removed from the first bicuspid tooth to just beyond the last molar, and nearly up to the middle line. The floor of the orbit—the cavity containing the eyeball—was not removed, as it had not yet been attacked. A small portion of the soft palate was removed. It was on Sunday, June 18, of that year, that Dr. R. M. O'Reilly, later surgeon-

general of the United States Army, examined a rough place in Mr. Cleveland's mouth. An ulcer was discovered, and the pathologist of the Army Medical Museum, in Washington, reported after examination that it was strongly indicative of malignancy. The operation was performed by Dr. Joseph D. Bryant of New York, assisted by Dr. Keen, Dr. E. G. Janeway of New York, Doctor O'Reilly and Dr. John F. Erdmann. Dr. Ferdinand Hasbrouck, dentist, also was present as an assistant.

"The operation was done entirely from the inside, so no tell-tale scar was left, and later the president was fitted with a rubber jawplate, which enabled him to retain his accustomed voice and pronunciation. Some weeks later a second operation was performed to remove additional tissue that we believed to be infected." Mr. Cleveland died fifteen years after the operation.—*New York Globe*.

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THE IVORY CROSS

The Ivory Cross has been organized in London for the purpose of taking care of the teeth of soldiers and sailors during and after the war. A number of important people are concerned in it in one capacity or another, including the Marquis of Crewe, Lord Burnham, editor of the *London Daily Telegraph*; Lord Beresford, the lord mayor of London, and Mrs. Lloyd George. It has secured registration under the war charities act and also an official authorization from the London war pensions committee. The *Daily Telegraph* says: "It is the plan of this new society that if a sailor, for example, has the toothache at Liverpool, and has no time to look after it before going on board ship, or if the treatment of it has only begun before he leaves that port, the necessary attention or continued treatment may be secured at Hull, or at any other of the English ports at which his ship may touch. In the same way returned soldiers, wherever they may be overtaken by a bad tooth, are to go to the nearest dentist for relief, the dental profession of the entire kingdom being organized to furnish treatment in such cases."—*American Dentist*.

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The State of Maine has passed a new dental law (which became operative on July 7, 1917) providing for the training and employment of female dental hygienists under the supervision of licensed dentists. Owing to an opinion of the State's Attorney-General, no examination for license could be held until after January 7, 1918.

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Experience will no doubt establish the fact in the United States Army that the presence of twenty teeth, or even thirty-two teeth, is no guarantee of dental efficiency. Men are safer in wet trenches with no teeth than with pulpless or decayed teeth. The great work of the dentist in the army is extracting, filling, stopping pain, repairing failing dental operations and artificial dentures. A few are required for the spectacular restorations after injury. The dentist who helps to win the war is the one who makes

the soldier fit and keeps him so rather than the one who repairs the wastage.—*A. E. Webster, Pacific Dental Gazette.*

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DENTAL ARMY AND NAVY CLUB

To foster the spirit of patriotism an Army and Navy Club has been organized at the College of Dental and Oral Surgery. The organization comprises the eighty-two students who are in the Army or Navy Enlisted Medical Reserve Corps and also alumni serving with the colors.

At the first meeting Dean Carr commended the men on the spirit manifested. The following officers were elected: Honorary president, William A. Carr, A.M., M.D., D.D.S.; president, Clifford S. Wheeler, '18; vice-president, Charles A. McKevitt, '18; secretary, Henry O. Howgate, '18; treasurer, William Redmond, '18; sergeant-at-arms, Lucien Schmitt, '19.

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PHYSICIAN IMPRISONED IN GERMANY FOR PUBLISHING BOOK

According to the *Progrès médical* of Paris, Professor Nicolai of Berlin has been imprisoned. It says:

"The correspondent of the *Observer* at Berne announces that Prof. G. F. Nicolai, formerly physician to the imperial family and professor of physiology at the University of Berlin, has just been condemned to imprisonment in a fortress and his property confiscated.

"This measure was taken in consequence of the publication of a book entitled 'The Biology of War' in which Professor Nicolai pointed out the warping of the conceptions of German scientists and military men in the course of the hostilities. Among other things, he said:

The military personage who is numbered among the most prominent, but whose name I shall not mention, inquired of me whether it might not be possible to fix shells with cholera germs or plague bacilli so that the shells could be sent back of the front firing line.

As I replied to him that I did not think it would do to use procedures so lacking in humanity, he answered me in a tone tinged with contempt, "Humanity is not to be considered in this war, and Germany has a right to do everything she pleases."—*Journal of the A. M. A.*

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The Anti-Saloon League has introduced a bill into the Legislature which would make New York State bone dry from October 1, 1918, for the period of the war and for a demobilization period for one year thereafter. The bill provides for the manufacture and sale of alcoholic liquor for medical, mechanical, scientific or sacramental purposes, where such manufacture and sale are not now excluded by the vote of the people. Governor Whitman has indicated that he will sign the bill.

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Briefly, in a previous editorial, we have pointed out to young men in the army that much fighting is done with the teeth.

We no longer fight our enemy, seizing him by the ear while we strangle him in the old fashion of animals and savages. But we do fight with the strength given to us by our food; chew it, prepare it for digestion, and thus with those weapons called teeth give to the body the good blood and the strength with which fighting is done.

Good digestion depends on good teeth.

Good eyesight depends on good digestion.

You may truly say that a man sees with his teeth, as he fights with his teeth.

Going into the army, with change of food, of water, of life habits, care of the teeth is extremely important and at the same time apt to be neglected.

Many young men are together in close quarters; they work hard from daylight in the morning until they are exhausted in the evening. No wonder their inclination is to throw themselves on their cots in the tents with little attention to the fighting weapons that nature has put inside their mouths.

But a greater mistake could not be made. As a good soldier carefully cleans and oils the rifle that has been exposed to wet and to rust, so the wise soldier carefully cleans and brushes the teeth that will be important to him and contribute to his happiness and health and success twenty-five and fifty years from now, when that rifle and this war will only be memories to him.

Bring back your teeth in good order; young soldiers.—*Atlanta Georgian*.

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MEDICAL CLINIC FOR DEFECTIVE SPEECH

In view of the fact that there are a great number of people who are troubled from some form of speech or voice disorder and that a great many American soldiers and sailors are likely to return from the front with their powers of speech impaired either as the result of wounds or shell shock, the various branches of medicine bearing on the treatment and cure of speech defects have been coördinated in a new clinic.

The New York Clinic for Speech Defects is located at 143 East Thirty-seventh Street, New York. It is composed of a number of departments: a medical department to take care of the physical condition of the applicants; a dental department to take care of teeth, mouth and jaw conditions when such conditions are the causative factors of defective speech; a nervous and mental department to take care of such conditions when they are causative or associated with defective speech; a reëducational department to reëducate patients to overcome their faulty voice or speech habits. A department for teaching of lip reading to deaf soldiers and sailors, as well as laymen, will also be one of the features.

At this clinic, too, practically for the first time in America special

provisions will be made to cure foreigners of their accent by treating the accent as a defect of speech.—*Dental Digest*.

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Columbia University Plans Diagnostic Clinic.—The trustees of Columbia University announce that plans are being perfected for the establishment of a large diagnostic clinic for the people who do not wish to accept charity and who are unable to pay for the services of a number of experts whose special advice or examinations may be needed in order to make a diagnosis. The plans propose that this clinic shall act as a distributing center for a number of hospitals. The financial arrangement provides that every clinical worker will be paid for his work and every patient charged a proper fee commensurate with his income. In his announcement, Dr. Samuel W. Lambert states that some opposition from the rank and file of the profession is expected; the aim of the clinic, however, will be to return the patient to the family physician for treatment after the diagnosis has been made. Columbia University also contemplates adding a fifth year to the medical curriculum, during which all candidates for licensure will work in a hospital under college discipline, and that additional provision is to be made for postgraduate and research work.—*Journal of the A. M. A.*

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Northwestern University Dental School, Chicago, has one of the largest, best arranged and finest equipped dental museums in the country, and with the addition of the private collection of Dr. William Bebb, it assumes a place in the field of dentistry which offers great benefits to those who have the good fortune to visit it.

This collection is made up of specimens of past geological periods as well as modern animal and human skeletons, and individual skulls and other bones not attached to the whole skeleton—also many varieties of preserved fur animals.

The collection of ancient and modern dental instruments, tools and equipment is one of the choicest I have ever seen. There are, on the commodious shelves, hundreds of neatly arranged volumes of rare old dental books, many of them worth their weight in gold to the dental scientist.

Dr. William Bebb, who has charge of this museum, is a scientist. He is a whole-souled chap, interested in his work and his greatest pleasure in life comes from building his museum up to that standard of completeness where it will contain a specimen of everything in any way connected with the teeth. He has builded well and for the dentist who visits Chicago, there could be no greater intellectual treat than a visit to this museum.—*American Dentist*.

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Osler, in speaking recently of "the needless deaths of peace," stated that in 1915, "while nine of our soldiers, abroad, died every hour to save

their country, twelve babies died at home in the same time." He said of syphilis that it is an easy first amongst the ten best killers; and of the gonococcus, that although it is not a great destroyer of life, it is the greatest known preventer of life. "With thirty to forty per cent. of all cases of congenital blindness, with the chronic pelvic mischief in women, and with the unhappiness of sterile marriages, as a misery producer, the gonococcus is king among germs."—*Journal of the A. M. A.*

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Daylight Saving.—A bill to carry a daylight-saving plan into effect is under consideration by the Committee on Interstate Commerce of the House of Representatives. In substance it provides that the clock be advanced one hour in April and moved back in September. The Health Department of New York City has expressed its approval of this measure in the interests of public health, believing it will promote outdoor life.

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DENTAL CLINIC TO BE HOUSED IN EACH NEW YORK SCHOOL

According to the new plans of the Board of Education of New York City, room for a dental clinic is to be provided in each public school of New York City. In several of the new schools which are under construction, or about to be started, a room has been set aside for the establishment of a free dental clinic for the pupils. Not a great deal of room will be required and it is expected that if the scheme works successfully in the new buildings, additions will be made for similar purposes in the old schools.

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BINGHAMTON, NEW YORK, DENTIST FINED FOR FALSE ADVERTISING

Dr. Edward L. Hewson of Binghamton, New York, who has been defending himself against prosecution for advertising under the name "King Dental Offices," was found guilty on January 15 by Justice A. V. S. Cochrane of the Appellate Division of the New York State Supreme Court and was fined \$300 and costs and \$100 for each insertion of his advertisement in the newspaper. The court found that the object of the advertisement was calculated to make the reader of it believe that Dr. King was still in charge of the dental office and that patients would receive treatments endorsed or recommended or given by Dr. King, though the latter had no connection with the practice. Dr. Hewson contended that he formerly lawfully practiced dentistry under the name of "King Dental Offices." However, the court held that this did not aid him, as the statute recently enacted forbidding such advertising, was legalized especially to apply to such cases.

This is the first real test of the constitutionality of the new New York

State Dental Law, including the clause prohibiting false or misleading advertisements, and the decision on this point reads as follows:

"It is a part of the Public Health Law and designed to improve the health, physical condition and welfare of the people of the State, and being a valid exercise of police power, it became binding even though it made that unlawful which before was lawful."

The editor of *Items of Interest* says: "There certainly is no ambiguity about this language, and the dental parlor man finds his last prop removed. The judge cites decisions from the courts of Texas and of West Virginia. He might likewise have cited a decision in Rhode Island, which was later sustained by the U. S. Supreme Court. This effectually destroys all arguments against the rights of States to enact such laws."

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Beginning with February 1, the dental school of the University of Pennsylvania, located at Philadelphia, charged the patients for the more expensive materials used in the clinics. Previous to that time patients paid for gold fillings only, but now nominal charges are made for silver and cement. It is also now required that those patients having putrescent pulps must submit to an X-ray examination before and after the dental student operates. This provision is to safeguard both parties. An extra charge will be made for X-ray treatment.

This latter treatment is certainly a needed one for the protection of the public against the imperfect root canal work of the student, as yet unskilled.

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The office of the secretary of the National Dental Association and the editor of *The Journal of the National Association* has been removed from Huntington, Indiana, and is now located at 127 North Dearborn Street, Chicago, on the tenth floor of the Unity Building. Dr. Otto U. King tells us that he is now nicely located in the new headquarters. He says that so far, they find that no mistake was made in bringing the office of the National Association into a greater dental and medical center. The move has given new impetus to the work of the organization and also, particularly to the development of the journal. Chicago is really an ideal location for the headquarters of a national organization and being in Chicago puts Dr. King in closer touch with the organized dental profession of the United States and makes it much more convenient for him to transact business pertaining to the business of the association and the journal. Various new departments of the journal which have been inaugurated and the improvement of other departments can now be more promptly and efficiently looked after.

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A letter worthy of *your* earnest attention and study, although addressed to Dr. W. D. Stevenson of the Second District Society of New York:

DEPARTMENT OF HEALTH
of the City of New York.

January 22, 1918.

My Dear Dr. Stevenson—During the last few weeks the question of root canal work in our dental clinics has again come into the foreground. Dr. Carney, Supervising Dentist, had instructed all of the dentists who were working in the clinics not to do any root canal work except on front teeth and then only if the loss of the tooth would seriously interfere with the comfort and well-being of the child. When it was essential to have the work performed it was done under the most aseptic precautions.

A short time ago, Dr. M. L. Rhein made vigorous objections to our doing this work at all. I have tried to obtain some information on the subject and understand that only a small proportion of dentists in the city are able to use the necessary precautions in the private offices, and in practically all of the clinics the work is being done in a manner which Dr. Rhein does not consider proper. May I ask for your opinion as to whether it is proper and right for us to do this root work in our dental clinics, provided it is only done on the front teeth and in cases in which the loss of the front tooth would seriously inconvenience the child? It is understood, I presume, that the city lacks facilities for caring for these children, and if we do not treat them, the only alternative is extraction of the tooth. I would greatly appreciate your opinion in this matter.

Cordially yours,

(Signed) S. JOSEPHINE BAKER,

Director, Bureau of Child Hygiene.

—Second District Bulletin.

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NAVY'S CALL FOR BINOCULARS

Navy Department,
Assistant Secretary's Office,

Washington, January 11.

Sir:—The Navy is still in urgent need of binoculars, spy-glasses and telescopes. The use of the submarine has so changed naval warfare that more "eyes" are needed on every ship, in order that a constant and efficient lookout may be maintained. Sextants and chronometers are also urgently required.

Heretofore the United States has been obliged to rely almost entirely upon foreign countries for its supply of such articles. These channels of supply are now closed, and as no stock is on hand in this country to meet the present emergency, it has become necessary to appeal to the patriotism of private owners to furnish "eyes for the Navy."

Several weeks ago an appeal was made through the daily press, resulting in the receipt of over 3,000 glasses of various kinds, the great majority of which has proven satisfactory for naval use. This number, however, is wholly insufficient, and the Navy needs many thousands more.

May I, therefore, ask for your cooperation with the Navy, to impress upon your subscribers, either editorially, pictorially or in display, by announcing in addition to the above general statement the following salient features in connection with the Navy's call:

"All articles should be securely tagged, giving the name and address of the donor, and forwarded by mail or express to the Hon. Franklin D. Roosevelt, Assistant Secretary of the Navy, care of Naval Observatory, Washington, D. C., so that they may be acknowledged by him.

"Articles not suitable for naval use will be returned to the sender. Those accepted will be keyed, so that the name and address of the donor will be permanently recorded at the Navy Department, and every effort will be made to return them, with added historic interest, at the termination of the war. It is, of course, impossible to guarantee them against damage or loss.

"As the Government cannot, under the law, accept services of material without making some payment therefor, one dollar will be paid for each article accepted, which sum will constitute the rental price, or, in the event of loss, the purchase price, of such article."

Toward the end of January, it is proposed to distribute throughout the country, posters making an appeal to fill this want of the Navy.

As this is a matter which depends entirely for its success upon publicity, I very much hope that you will feel inclined to help the Navy at this time by assisting in any way that lies within your power.

Very sincerely, yours,

FRANKLIN D. ROOSEVELT,
Assistant Secretary of the Navy.

* * * * *

The following applies to dentists as well as to physicians:

WAR REVENUE LAWS AND THE DISPENSING OF ALCOHOL BY PHYSICIANS OR DENTISTS

Under the War Revenue Act of October 4, 1917, which went into effect December 1, 1917, and the subsequent regulations, druggists and physicians or others desiring to use or sell distilled spirits for medicinal or any other non-beverage purposes are required to obtain a permit and file a bond with the Government, provided, however, they desire to use or sell alcohol beyond the limitations prescribed. The matter concerns the physician on the question of supplying himself with tinctures, fluid extracts and other prescriptions containing alcohol, of prescribing these for his patients, of securing alcohol for antiseptic purposes or for bathing, and finally and especially, it concerns those physicians who dispense their own medicines.

As regards the use of alcohol for topical or local applications: Bonded druggists are permitted to sell to anyone quantities of alcohol up to one pint, provided this alcohol has been modified as provided by the regulations to prevent its use as a beverage. The container of such alcohol must bear the "poison" label. The following are the modifications that meet Government approval:

1. Carbolic acid 1 part, alcohol 99 parts.
2. Formaldehyde 1 part, alcohol 250 parts.
3. Bichloride of mercury 1 part, alcohol 2,000 parts.
4. Bichloride of mercury 0.8 gram, hydrochloric acid 60 c.c., alcohol 640 c.c., water 300 c.c.
5. Bichloride of mercury $1\frac{1}{2}$ grains, hydrochloric acid 2 drams, alcohol 4 ounces.
6. Formaldehyde 2 parts, glycerin 2 parts, alcohol 96 parts.
7. Carbolic acid 1 dram, tannic acid 1 dram, alcohol 1 pint, water 1 pint.
8. Alum $\frac{1}{2}$ ounce, formaldehyde 2 drams, camphor 1 ounce, alcohol and water, each 1 pint.
9. Lysol 1 part, alcohol 99 parts.
10. Liquor cresolis comp. (U. S. P.), 10 c.c., alcohol 1,000 c.c.

As the physician who dispenses alcohol or alcoholic preparations places himself in the position of a druggist, he, too, must give bond and secure a permit. But it is clear that the man who simply prescribes alcoholic preparations or alcohol for local use, or who uses small quantities of alcohol in his office as an antiseptic, etc., need not give bond or secure a permit, as his practice is not interfered with by the law. Therefore, it is not necessary for physicians, who do not dispense, to give bond and secure a permit.

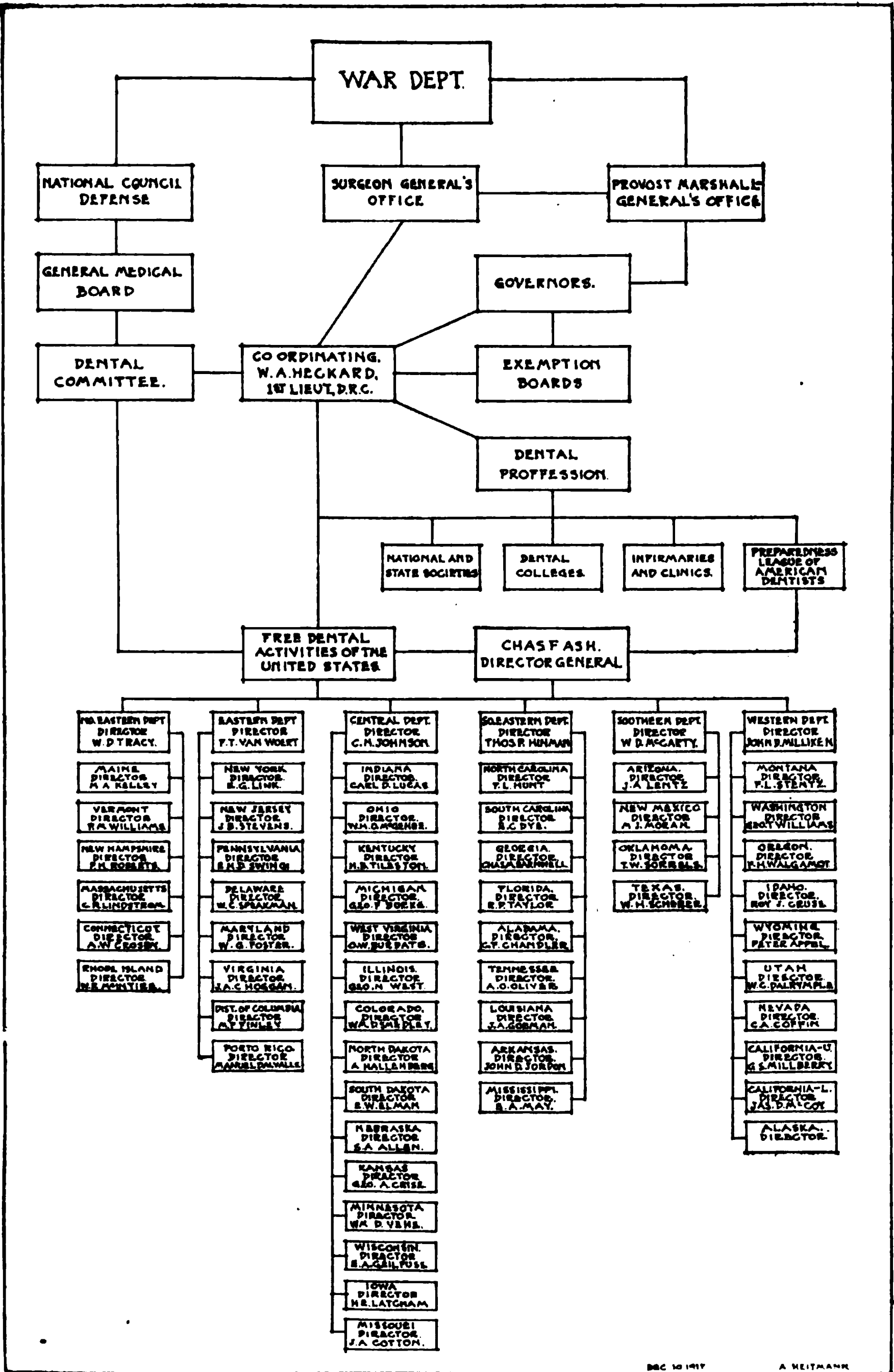
Hospitals, laboratories and those using large quantities of alcohol will have to secure the permit.

To repeat, the average physician will not need to secure a permit; the physician who dispenses, places himself in the position of a druggist and must have a permit.—*Journal of the A. M. A.*

* * * * *

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS NOTES AND NEWS OF IMPORTANCE

The treasurer, Dr. L. M. Waugh, reports a most satisfactory response to the circular letter recently sent out as a means of recruiting members.



SHOWING PLAN OF CO-OPERATION OF WAR DEPARTMENT WITH THE
DENTAL PROFESSION IN FREE DENTAL ACTIVITIES.
W. A. HECKARD, LIEUT. D.R.C., U.S.A.

A careful tabulation has shown that prior to January 1, 1918, there were, in round numbers, 5,700 members of the League. Up to February 1, in response to the circular letter above-mentioned, 4,900 new members had been enrolled, and Dr. Waugh reports that applications for membership have come in so rapidly, about a hundred a day, that as yet it has been impossible to classify by states.

By a recently made rule, the buttons are to be sent to new members without extra charge. (Old members can get the button for 25c.) Therefore, members will please do two things: Get your button; *wear your button*. You are asked to wear it, not to advertise yourself, nor the League, but we want to make the man without a button conspicuous.

All dentists who have not yet filled out Form 3A are requested to do so at once and mail the same to Lieutenant Heckard.

My Dear Dr. Ash—I am just in receipt of one of your circulars of the Preparedness League of American Dentists, and would sign up and return cards only I am a physician and surgeon, and I am furthermore disabled with arthritis from actively participating in your efforts.

However, despite my disability and the limitations of a wheel-chair, I am coöperating with the Surgeon General and Council of National Defense in recruiting expert anesthetists for immediate service at the front in the base hospitals and casualty clearing stations.

In this recruiting we have not drawn any lines between the surgical and dental anesthetist, believing that both are fully competent for this service. The Interstate Association of Anesthetists, of which I am secretary, has welded the interests of the medical and dental professions so thoroughly that recently in Ohio our Attorney-General, in an opinion, delegated equal privileges to medical and dental anesthetists. We are anxious to have the verdict of the war hospitals indorse this amalgamation.

It has been with some difficulty that we have persuaded the Surgeon General that anesthetists, surgical and dental, are in great demand at the front. To emphasize their value Captain Gwathmey of the Lakeside Unit, while loaned to the British Army, during the attack on the Messines Ridge, kept three surgeons busy and standing at the head of three tables, radiating like spokes of a wheel, put thirty-four wounded soldiers under anesthesia during a period of five and one-half hours. Truly a record, and showing what the expert anesthetist can do in limiting the horrors of war.

The German, French and even the English anesthetic service collapsed promptly at the outset of the war, and thousands of wounded were operated on without anesthesia, agents and administrators both being lacking. We are trying to avoid such a collapse of our surgical and dental service.

In this connection, if in your canvass you encounter any dental anesthetists who desire active service, or who will accept anesthetic service at Base Hospitals at home, or are competent to act as instructors, or to

replace those men in hospitals who have lost staff anesthetists to active service, let me have their names and addresses and I will try and see that they are given their chance of doing their bit.

Appreciating the efforts you are making and wishing you every success, I remain,

Cordially yours,

F. H. McMECHAN.

Avon Lake, Ohio.

The Government has established a new and improved system of dealing with men who claim exemption because of alleged physical defects. What are known as "Medical Advisory Boards" have been formed, to which a man may appeal from the decision of a local Exemption Board, or to which the Local Board may refer doubtful cases. These boards, for convenience, are located mainly in conjunction with hospitals, and include high-grade and skilled medical specialists.

Dentists have likewise been appointed to all of these boards. This is a recognition by the Government undoubtedly due to the services which have been rendered by the Preparedness League.

The majority of the dentists appointed on the Medical Advisory Boards are already members of the League. However, State Directors are requested to obtain the list of such appointments, and if they find thereon anyone who is not a member of the League, a personal letter will probably induce that man to join with us.

EXEMPTIONS FOR DENTAL DEFECTS

From early indications the dental members of the Medical Advisory Board will have ample work to do. These boards not only examine cases of appeal, but also those cases where the Local Board examiners are in any doubt as to the physical disability of the registrant. The men are then classified as follows: "For general military service," "For limited military service," or Exempt.

There has been a disposition on the part of the Local Boards to shift the responsibility for the dental cases, which will be partly overcome by the presence of dentists on these boards, otherwise the present number of dentists on the Advisory Boards will be inadequate.

The Selective Service Regulations admit of the broadest construction, and if taken literally, indicate that no man need be exempted because of defective or missing teeth.

In New York City, it has been decided, unless objections are made by the authorities, to form an association of the dental members of the Medical Advisory Boards. The first meeting will occur on February 18. Members of the Adjutant General's staff will be present to give the dentists instructions as to the interpretation of the regulations. The final decision of some of the ambiguous features will be published soon, for

the information of all League members officiating on Medical Advisory Boards.

The Government will probably appoint at least one dentist on every Local Exemption Board in the country. If League members would serve on these Boards, it would greatly facilitate the League's work, as in most cases the conscripted man could be directed at once as to where he could have his dental defects treated. Therefore, Directors of States are urged to scrutinize all appointments to Local Exemption Boards, and to enroll all non-members within our ranks as rapidly as possible. It is desirable to appeal to the Adjutant General of your State and urge him to secure nomination for these boards through the presidents and officers of Local Boards.

R. OTTOLENGUI,
Publicity Committee.

The above-mentioned organization of the dental members of the Medical Advisory Boards was held on February 18, as scheduled, with a goodly number in attendance, to hear Major Dowd in explanation of the new dental regulations of the Selective Service examination (not at this date available for publication). The following officers were elected: Drs. R. Ottolengui, as chairman; W. D. Tracy, as vice-charman, and Leland Barrett, as secretary.

Abstract from Dr. C. F. Ash's recent letter to his State Directors:

ORGANIZATION

February 2, 1918.

Dear Doctor—The recent letters of Lieutenant Heckard and myself, sent to every dentist in the United States, are bringing numerous patriotic responses, and hundreds of enthusiastic letters.

The returned cards are being classified according to States, and as soon as possible a list of the names and addresses of those from your State will be forwarded to you, together with letters received from dentists in your State. A follow-up in the form of a double postal card (Form No. 1) will be sent out about February 4 to every dentist in the United States, on which they will indicate the days and hours of service they are willing to give.

We are, at least, twice as well equipped with operators and should be five times as well equipped, so far as organization is concerned, as many of our State organizations were not in shape until the first draft was practically completed.

We should report 1,000,000 free operations for the men of the next draft. This means that every State must be thoroughly organized with a Preparedness League Unit in every center.

The plan of organization will naturally vary with the conditions present in the various States.

The War Department is helping us to help win the war.

Provost Marshal General Crowder has ordered that dentists be appointed as members of the Medical Advisory Boards in all the States. A copy of the diagram showing the relation of the free dental activities to the War Department has been sent to the Adjutant General of every State. Smaller copies of this diagram will be sent to you in sufficient numbers so that you can send one to the director of every Preparedness League Unit in your State. This diagram, signed by you, is to be presented by the local director to the president of every local board in his territory and will act as his credentials in securing the co-operation of the local boards.

In several States, dentists have been appointed to every Local Exemption Board; undoubtedly this will be done in most of the States later on. Meantime, we must secure as close coöperation as possible.

The director of each State Department is ready to assist you in every possible way. When in doubt as to procedure, write him for instructions.

CHARLES F. ASH,
Director General.

If the new National Army is only the equal of the German machine in organization, training, equipment, the one fact that it is the Army of a free people will make it a fighting force superior to the enemy divisions. Its spirit will be higher, for it is in no sense the creature of a military caste, doing what it has been told to do. That alone will be enough to win.

But the purpose goes deeper than that. A nation that has outrivaled the world in economic organization has now bent all its powers to produce a perfect Army. That it will be a product such as was never before seen, there can be no question.

Down at one of the cantonments the boys have created a war song for themselves which goes:

"The Stars and Stripes will wave over Germany,
Wave over Germany, wave over Germany;
"The Stars and Stripes will wave over Germany,
Just about a year from now."

It is very possible that the date of the event predicted is not accurately fixed. No man can say as to that. A week, a month, a day on the Western Front may change the situation entirely.

But this much is certain: that the first contingent of the National Army will be carrying the flag forward towards that goal within a year, and that wave on wave of other National Army men will be rising behind them to join in the fight until the prophesy has been made good as to the fact.—*Army and Navy Register*.

* * * * *

One of the questions shortly to be taken up by the Administration will be the conscription of service, a term preferred by some to that of conscription of labor, although the difference is one of title rather than one of purpose or effect. The time is not far distant when it will be necessary to provide adequately trained and competent labor in the munition plants, shipyards and mines and on the railroads. The draft for the National Army which is next to occur and those that are destined to follow twice annually, if the war lasts long enough, will necessarily subtract from available labor in great volume and it is essential that there be some regulation of this situation, so as not to deprive the industries of the country of workmen. There is so much objection to conscription of labor that it is foreseen there may be successful resistance to an effort in that direction. At least, one would be justified in assuming as much from what has occurred on the West Coast, notably in the building of ships, so vitally necessary in the maintenance of an efficient and sufficient oceanic transportation. Conscription of service may, through the magic of a designation, diminish or entirely remove the opposition, which is an argument decidedly in its favor, but it is quite evident that something drastic will have to be done sooner or later in order to regulate and acquire labor

where it is needed for the benefit of the country in time of war.—*Army and Navy Register*.

* * * * *

With the alluring reports which have come indirectly from Germany of the existence of dissatisfaction among the people of that country over the prospect of an indefinite continuance of the war, there is the inevitable discussion of the effect of a sudden termination of hostilities, although those who are indulging in this harmless exchange of views are not taking the situation too seriously, for there is always the suspicion that reports of this character may be inspired and afforded circulation by the cunning adversary for occult reasons of his own. If the war ended within the next month, it is quite evident, of course, that there would be a disturbance in the way of readjustment in both the War and Navy Departments well nigh equal to the activities which marked the commencement of hostilities. Under the Navy Department there are, in course of construction, ships and accessories in all branches representing expenditures amounting to one billion dollars. It will be a question what can be done with this work, a large portion of which would be of no special value for immediate conclusion if peace were declared. Under the War Department there is under contract a much larger volume of work which would be in the same condition, requiring the solution of a problem that is bound to be troublesome. The military and naval authorities do not consider that the situation is sufficiently affected by the rumors of disturbance in Germany to require them to reduce their energies in the preparation for war on land and sea. At the same time they do not avoid the interesting speculation as to what will happen in many directions in the way of dismantlement when war shall cease.—*Army and Navy Register*.

* * * * *

RUMORS AND RUMORS OF RUMORS

At such times as these every conceivable sort of rumor and whispered report of disasters, graft, mismanagement and betrayal circulate with maddening persistency. Few of those who listen with wide eyes and dropping jaw to the whispered rumor that the entire American contingent has been wiped out or that fifty per cent. of our young men are dying in the camps, and a thousand other lies, stop to think that there is a considerable and virulently active percentage of people in the country who are making it their business to start, and keep circulating every conceivable sort of lie and rumor of disaster, thereby rendering yeoman service to our open enemies.

When you listen to the malicious reports and rumors that are constantly spread broadcast and then give them added circulation you are aiding the enemies of the country more effectively than you could if you destroyed an American army brigade.

This is a time when unswerving loyalty and support is not alone due

to President Wilson, but is also a time when we are liable to lose completely by failing to give it.

The next man who whispers into your ear some malicious report concerning our armies or the conduct of public affairs, or the death-rate in the camps, or a slur on the President, just classify him as an agent of the Kaiser serving his master.—*Illustrated Review*.

BOOK REVIEWS

ANATOMY AND HISTOLOGY OF THE MOUTH AND TEETH. By I. NORMAN BROOMELL, D.D.S., Professor of Dental Anatomy and Clinical Dentistry, Philadelphia Dental College, and formerly Dean and Professor of Prosthetic Dentistry, Dental Anatomy and Histology, Dental Department, Medico-Chirurgical College of Philadelphia; and PHILIPP FISCHER, M.D., Associate Professor of Histology and Demonstrator in Embryology, Medico-Chirurgical College of Philadelphia. Fifth ed., revised, 368 illustrations. Phila., P. Blakiston's Son & Co., 1917; cloth, \$3.00.

This very thorough and carefully prepared textbook is designed for the dental student who desires a more particular knowledge of his field than that put forth in the average work. The book is divided into two parts, Anatomy and Histology and Histogenesis. Part I takes up the anatomy of the oral region, in the somewhat unusual order of from without inwards; thus the muscles, blood vessels and nerves precede osteology; but the arrangement is clear and logical. The descriptions of the muscles of the face, the tongue, and associated soft parts are specific and concise, and the illustrations satisfactory. The bones and the temporomandibular articulation are considered very fully, likewise the blood and nerve supply to the teeth. We commend especially the chapters on dental anatomy—to which over 100 pages are given. Each tooth in the adult and deciduous sets is considered comprehensively and minutely—externally, and with a view to the study of the pulp chamber. We note that the old classification of tooth forms, under the temperamental types, is retained, though according to Williams this is not in keeping with our knowledge of the subject.

Part II is devoted to the embryology and histology of the oral and dental tissues. These chapters are very full and valuable—especially those treating of mucous membrane, salivary glands, the dental tissues, and of tooth development. A good index adds to the value of this work. Upon the whole, we believe this textbook will be found to be of first-rate working value to the student—especially the graduate student—of this great subject.

LECTURE-NOTES ON CHEMISTRY FOR DENTAL STUDENTS, by H. CARLTON SMITH, PH.G., Lecturer on Physiological and Dental Chemistry, at Harvard University Dental School; Hon. Memb., American Academy of Dental Science, etc., etc. Third ed., pp 455, revised and enlarged. New York, John Wiley & Sons, Inc. London, Chapman & Hall, Ltd., 1917.

This manual of dental chemistry is arranged under nine parts, as follows: Salts of the Metals and Qualitative Analysis, Dental Metallurgy, Volumetric Analysis, Microchemical Analysis, Organic Chemistry, Physiological Chemistry, Digestion, Urine, Metabolism. It is designed expressly for the undergraduate student, and subjoined to the preface is given to him some wholesome and practical advice on habits and methods of study. An introductory chapter covers the definitions and various theoretical principles. The treatment of the subject of metals is clear,

concise and practical, the dental use of each metal being given. Chapters on solders, amalgams, cements, recovery of residue, etc., contain much valuable information for the practitioner who has grown away from laboratory technic; and this may be said especially of the chemistry of dental medicines, their properties and standard tests. The vast subject of organic chemistry is opened up in a way calculated to give the student a working knowledge of the leading hydrocarbon groups, of the carbohydrates and proteins, from which a more exhaustive study may intelligently be taken up. The properties and constituents of saliva, and salivary analysis, gastric and pancreatic digestion and bile, the properties and constituents of urine and tests for the same, are very fully considered, and add much to the value of the book. We are glad to commend this volume as a classroom manual, and further, as the kind of book the practitioner should have at hand for its well arranged, well presented subject matter.

DR. J. F. P. HODSON

OBITUARY

DR. J. F. P. HODSON¹

Dr. Joseph Frederick Pell Hodson, an active member of the First District Dental Society from its organization, was born in Ithaca, November 9, 1833, and died November 8, 1917.

He was the eldest of eight children, of whom only Judge I. P. Hodson of Buffalo survives him. Dr. Hodson left home at twelve years of age and entered a dry goods store in Syracuse as an apprentice. He studied nights; and, as his education progressed, he developed a desire to lead a professional rather than a mercantile life.

He came to New York in 1866, and, if my memory serves me correctly, became an assistant to Dr. Norman W. Kingsley, who was then Dean of the New York College of Dentistry. Soon afterward, he entered this college and graduated in 1867—the “honor man” of the first graduating class of the college. Upon graduation he became an associate of Dr. William H. Dwinelle, with whom he remained several years before opening an office for himself. He enjoyed a large and lucrative practice, chiefly among the most cultivated families of this city, and having accumulated a competency, he retired about six years ago.

While in active practice he became President of the First District Dental Society, and also served as President of the Odontological Society of New York. On January 9, 1911, Dr. Hodson was honored by being elected a Trustee and a Director of the New York College of Dentistry. He was always a loyal alumnus and took a keen interest in the growth and welfare of his Alma Mater. At the Fiftieth Anniversary of the Organization of this College, he was elected an honorary member of the Psi Omega Dental Fraternity.

I became acquainted with Dr. Hodson in the autumn of 1866, as a student in the first class of the New York College of Dentistry. He was always very quiet and unassuming in man-

¹ Memorial Minute adopted unanimously at meeting of First District Dental Society, S. N. Y., Jan. 7, 1918.

ner, not readily forming intimate friendships with his fellow students. This exclusiveness he carried to a great extent through his professional life. He loved his profession and gave his best efforts for its development, being always jealous of its good name. Never did I hear him speak disparagingly of a fellow practitioner, whatever the provocation.

He was of a refined, artistic temperament as evidenced by his home surroundings, he having accumulated many valuable works of art. His affection for his home, his friends and his country was intense. Being exceedingly charitable, he gave freely, but discriminately, to those seeking aid.

During all these years, I knew him as an earnest practitioner, who rose beyond the average of his profession, always just in his judgments and his friendships, and leaving us an inspiring lesson of a self-made, liberal and patriotic citizen.

WILLIAM CARR.

NOTICES

CALIFORNIA STATE DENTAL ASSOCIATION

The California State Dental Association will hold its regular annual session for the year 1918 in San Francisco, July 8-13.

We will conduct our meeting this year on the Oklahoma plan, and feel that we can assure all who attend a pleasant as well as a profitable meeting.

Further information may be obtained by addressing the secretary, Dr. John E. Gurley, 350 Post Street, San Francisco.

MASSACHUSETTS STATE DENTAL SOCIETY

The fifty-fourth annual meeting of the Massachusetts State Dental Society will be held in Boston on May 1, 2, and 3, 1918.

J. ARTHUR FURBISH, D.M.D., Secretary.

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Memorial Monument to
GREENE VARDIMAN BLACK
to be unveiled at Chicago during the meeting of the National Dental Association,
commemorating the 60th anniversary of organized dentistry, August 8, 1918.

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OF THE

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JUNE, 1918

No. 2

RESTORATION OF PORTIONS OF TEETH¹

By EDWARD B. SPALDING, D.D.S.

THIS paper is not a result of scientific laboratory experiments, but the statements put forth in it are based on clinical experience in private practice.

Not all of us are confronted with the same problems in the practice of dentistry, and some are privileged or called upon to use methods or to pursue certain lines of work which others are not or do not care to adopt.

No two people see the same picture in the landscape, and what is a prominent figure to one may be insignificant to another. Consequently, clinical observations are rarely exactly the same and what I have felt to be important factors in the restoration of portions of teeth, may be entirely insignificant to many of my listeners. I do, however, make the plea of honesty of purpose and claim that the ideas set forth are carried out as nearly as possible in my daily practice of dentistry.

The most important use of a tooth is mastication.

I am sure we all agree that a tooth can best functionate when in a state of health, with healthy pulp, healthy pericemental membrane and in normal occlusion.

The volume of evidence now piling up against the diseased,

¹ Read before the First District Dental Society, S. N. Y., Jan. 7, 1918. See disc., p. 157.

devitalized tooth and the infected pericemental membrane, makes us pause and ask ourselves if we are sufficiently considerate of the periodontal tissues and of the live pulps of the teeth upon which we are making restorations.

We have long been aware that the more perfectly a molar with a live pulp is tapered and shaped to receive a cast gold crown, and the better the crown fits, the shorter will be the life of that pulp. It is the large ill-fitting gold shell crown, which has caused destruction to the gum and pericemental membrane, that is liable to surprise us by housing a live pulp.

The large cast gold inlay, in contact with considerable surface of dentin, is almost as great an enemy to a live pulp as the cast gold crown.

The more familiar we are with the difficulties attendant upon the operation of root canal sterilization and filling, the more loath are we to remove a healthy pulp for any cause.

In restoring a portion of a tooth therefore, I feel we should consider carefully:

1. The preservation of the pulp.
2. The preservation of the gum and pericemental membrane.
3. The restoration of contact, tooth form and occlusion.
4. The esthetic effect.
5. Durability.

I want to say here that in making restorations of portions of a tooth there is one material which I feel meets more of the above mentioned considerations than any other at our command and that is porcelain. Before speaking further about porcelain, however, I will refer briefly to oxyphosphate cement, silicate cement, amalgam and gold for restorations, considering our five points.

Oxyphosphate cement, so far as my clinical experience goes, fulfils the first consideration, that of pulp preservation. I am aware that someone may take exception to this view but I do not believe, if a reliable cement is properly mixed, that there is sufficiently free phosphoric acid to injure the pulp, unless it is in absolute contact with the pulp through an exposure.

We could not dispense with cement, for it plays such an important part in our work of restoration, but as a material for a restoration alone, it cannot be considered anything but tem-

A

B

FIGURE 1

FIGURE 2

FIGURE 3

FIGURE 4

FIGURE 5

FIGURE 1.—The syringe devised by Dr. C. G. Myers which makes feasible high pressure anesthesia for sensitive dentin without injuring the pulp.

FIGURE 2.—The cervical or labial cavity.

"A" indicates cavity not of sufficient depth and walls too flaring to prevent cement shadow.

The incisal wall not being parallel with cutting edge of tooth makes it more conspicuous.

"B" a better formed cavity

FIGURE 3.—The lingual aspect of cavities prepared in incisors showing resistance form and retention form. Proximal cavities in incisors and cuspids should always be prepared by entering from the lingual so that the stress of mastication tends to seat rather than unseat the inlay. Failure to observe Black's principles of resistance form and retention form in the preparation of cavities is largely the cause of failure in both gold and porcelain inlays.

FIGURES 4 and 5 show both the lingual and labial aspects of a cavity in a central incisor which includes the incisal angle. Note the positive step formation which gives both resistance and retention. Note also that all enamel cavity walls are as near as possible right angles to the surface of the tooth, which gives a similar angle to the inlay, thereby obtaining the greatest possible edge strength to both enamel and porcelain and lessening cement shadow.

FIGURE 6

FIGURE 7

FIGURE 8

FIGURE 9

FIGURE 6.—Illustrates a very frequent repair necessary in a child's permanent incisor. The pulp being large, we wish to avoid encroaching upon it by too much cutting for resistance and retention. Note resistance groove in labial wall and positive retention toward the cervical, consisting of a deep round socket with flat floor and parallel walls made with a square and fisher bur. After the amalgam die is made of this cavity the socket is fitted with a porcelain rod. After burnishing the matrix on the die with no attempt to burnish the matrix into the socket, the rod is placed in position by pushing it through the matrix into the socket when porcelain body is packed about it in matrix and then matrix and rod removed from die to porcelain furnace and fused. Finish baking inlay as usual.

FIGURES 7, 8, 9, 10, 11 (see next page), illustrate a method of restoration of the incisal third of a central using the double porcelain post or rod for retention. Note in Fig. 7 wave line of joint, which is less conspicuous than a straight line. Figures 8 and 9 show the inlay and its seating. Fig. 10, the tooth and the amalgam die. In Fig. 11 we have "A," the porcelain rod ground from a manufacturer's tooth which is dense and strong porcelain; "B," the rods fitted into the amalgam die through holes in the matrix; "C," porcelain body in matrix holding rods in place. Note the cut in the porcelain to allow for shrinking of porcelain two ways during the fusing.

porary. Its lack of strength, the ease with which it is abraded, its solubility and its etched surface, all combine quickly to bring about unhealthy periodontal tissues, as well as loss of tooth substance. Its esthetic qualities are also very transitory.

Silicate cement is probably here to stay and occupy a place among our filling materials. In its early days it traveled a "rocky" road and I am not so sure that even now its path has been made perfectly smooth.

Let us *not* call it procelain. In so doing, we deceive neither ourselves nor our patients.

This material has a sufficiently etched surface to retain mucoid deposits so that it is an irritant to gum tissue and should not be used in cavities at, or near the gum. I am sure that most of our periodontists will bear me out in this statement. In cavities which extend near to the pulp, I have sometimes found silicate cement to be a decided irritant and yet on account of its ease of manipulation the operator may forget to use a lining of oxyphosphate cement.

Whatever is easy to do is seldom done thoroughly and well. He who is content to devote himself to the simpler forms of restoration, such as cement and amalgam present, soon loses his zest for them and his aim becomes a financial gain only, rather than achievement and the welfare of his patients. It is the striving for greater skill in difficult operations that develops the habit of taking pains which will not permit of simple work being slighted.

The chief objection to amalgam is its ease of manipulation. Its constant use is liable to make a careless operator. Unless placed very near to the pulp it does not endanger it from thermal shock as readily as gold. It is comparatively easy to protect the pulp with a layer of cement and still have sufficient retention for the amalgam.

Amalgam can be finished to a smooth surface, consequently does not hold mucoid deposits to irritate the soft tissues. It is quite capable of being molded and carved to restore form and occlusion, if sufficient pains are taken.

It is durable, that is, it withstands wear, but its color is its most objectionable feature.

The greatest objection to gold is that it is liable to produce thermal shock and permanent injury to a live pulp. I speak more particularly of the cast gold inlay and the gold crown. I feel we must use care to protect the pulp with a layer of cement wherever possible, besides the cement used in the setting of the inlay, and if we study our cavity preparation carefully we usually find it is not necessary to rely upon so much depth of cavity for retention.

The other objectionable feature of gold is an esthetic effect, one from the standpoint of color.

Cast gold can be polished so that the surface does not usually hold sufficient deposit to injure the gum, while it is capable of any degree of carving and shaping to bring out the anatomical restoration.

Its durability is unquestioned, if we mean indestructibility, but if the price of its use in a particular case is the life of a pulp, may we not pay too much?

In considering porcelain we will take first the preservation of the pulp.

After seventeen years of continuous use of porcelain for inlays and crowns I am convinced there is no other material which is so compatible to the dentin and pulp of a live tooth as is porcelain. I have found that all porcelain workers with whom I have discussed this agree. There need be no hesitation in placing a porcelain inlay in close proximity to the pulp if there is not an actual exposure or unless the pulp gives evidence of infection. It is the rarest experience to find irritation from it.

Since December 8, 1903, when I demonstrated the porcelain jacket crown before this Society, I have used many crowns of this kind over live teeth and, to my knowledge, the cases have been very few indeed in which there has been any kind of pulp trouble. The teeth which have in any way given trouble were cases of actual exposure of the pulp, from fracture or other cause, some time previous to the crowning and were undoubtedly infected before the crown was put on.

As to the preservation of gum and pericemental membrane, again, porcelain stands first if properly finished and fused. The high glaze of porcelain does not hold bacterial plaques as readily

FIGURE 11

FIGURE 10

FIGURE 12

FIGURE 13

FIGURE 14

FIGURE 12.—The porcelain jacket crown that was demonstrated before this First District Society, December 8, 1903.

FIGURE 13.—Models of case of six anterior jacket crowns made in July, 1903.

FIGURE 14.—Models of case of six anterior jacket crowns made in August, 1917.

FIGURE 15

FIGURE 17

FIGURES 15 and 16.—Method of taking impression of proximal cavity of incisor. The matrix material is block tin about .34 gauge, which is pliable enough to conform readily to the tooth and yet sufficiently rigid for the purpose of confining the modeling compound.

FIGURE 17 Matrix in place for impression of the restoration shown in Figs. 7 to 11

FIGURE 16

as the natural enamel. This is readily demonstrated by the use of the disclosing solution used by periodontists.

Contact, form and occlusion are easily restored by one trained in the carving of porcelain.

The esthetic effect of a restoration embraces both form and color. If an operator has an eye for neither form nor color, porcelain will probably fail in the esthetic qualification in his hands. It is possible, however, to secure the most gratifying results in imitation of the natural tooth, if time and patience are spent in acquiring the requisite skill.

How about the durability of porcelain?

If we try to use porcelain in the same manner as gold is used, it would not be credited with durability. Because a gasoline engine was not practical in the old-fashioned high-wheeled buggy was not an argument that gasoline could not be utilized to propel a vehicle. The desirable reasons for applying the power of the gasoline engine to means of conveyance were many enough to cause man to change the old accepted form of the horse drawn carriage.

The desirable features of porcelain are many and great enough to warrant our being willing to come to *its* requirements of cavity formation and to select the suitable places for its application. When we do this, porcelain is durable.

The greatest drawback to the use of porcelain is *time*; time necessary to acquire the requisite skill for its use, and the time necessary to the construction of the different restorations.

If the operator does all of his own laboratory work, he probably will not have time for porcelain, but if he has a competent laboratory assistant, or he is willing and has the ability to train one, then he will find work in porcelain a most gratifying part of his services to his patients.

I will leave suggestions as to cavity formations until we see the slides.

There is one thing which is a great handicap to thorough preparation of teeth for all kinds of restorations and that is the sensitiveness of a live tooth.

Some of our conductive anesthesia friends say they have found the solution of the pain problem in dentistry, and that from

now on life will assume a bright cerulean hue. However that may be, there is another successful means of making comfortable operations on sensitive teeth. It is so old that many of my hearers thought it was buried some years ago. At any rate they are quite sure, and so am I, that it *was* the means of destroying many good pulps which should have remained alive. It is high pressure anesthesia for sensitive dentin.

You will notice I did not say "and the removal of pulps." That is another story. Some one has said that "It takes a great deal of ignorance to be very positive." From clinical experience, however, I am very positive about some things concerning high pressure anesthesia. One is, that when *properly* used it seldom, if ever, causes injury to the pulp that is any clinical evidence of injury. Another, it is efficacious in desensitizing dentin in the great majority of cases.

It is not difficult to apply after its technic is once learned. It is suitable to use on teeth having considerable sound enamel and dentin, so that application may be made through healthy dentin immediately under the enamel.

I will mention a few reasons why high pressure anesthesia was a failure in many hands some twelve or more years ago and why it is now not used more extensively.

Very few who tried its use had a proper syringe. Application of the anesthetic solution was made through carious dentin carrying infection to the pulp and certain trouble resulted. The application was made too close to the pulp.

Either a too strong solution was used, or too much pressure or too long an application, or all three, resulted in death to the pulp. A non-sterile solution probably caused the pulp infection. The technic of getting a tight fit with syringe point in the dentin was difficult for some to acquire.

Briefly the requirements for success with high pressure anesthesia are:

A well made, accurate, strong syringe with positive action which can be readily controlled by the operator. A two per cent solution of cocain in sterile water.

Application through enamel into healthy dentin, not having tubuli clogged with the debris of caries.

FIGURE 18

FIGURE 19

FIGURE 20

FIGURE 21

FIGURE 18.—Lateral incisor prepared for porcelain jacket crown. This model is made to show the positive shoulder preparation. In an actual case the shoulder is just below the gum line, which prevents the joint showing.

FIGURE 19.—First bicuspid root reinforced with two screw posts having square heads and the preparation with shoulder as in case for regular jacket. A strong and artistic method of restoring devitalized teeth which lack sufficient dentin for a regular jacket.

FIGURE 20.—An enlarged view of amalgam die of Fig. 19 case.

FIGURE 21.—Method of taking impression for jacket crown.

FIGURE 22

FIGURE 23

FIGURE 24



FIGURE 25

FIGURE 26

FIGURE 22. First step in taking bite. A small ring (one which will not go over the shoulder) is filled with modeling compound and an accurate impression taken of the prepared end of tooth. Wet cotton is packed in as shown in cut to exclude modelling compound from under cut.

FIGURE 23. Bite taken in modelling compound.

FIGURE 24.—The bite removed, carrying with it the small ring having an accurate seat for the amalgam die.

FIGURE 25.—"A." An impression of a cavity. "B." Impression surrounded with thin wax to assist in investing. "C." Impression invested in rubber ring filled with plaster of paris. "D." Impression packed with amalgam.

FIGURE 26. Illustrates amalgam die mounted in ring of articulating frame.



FIGURE 27



FIGURE 29

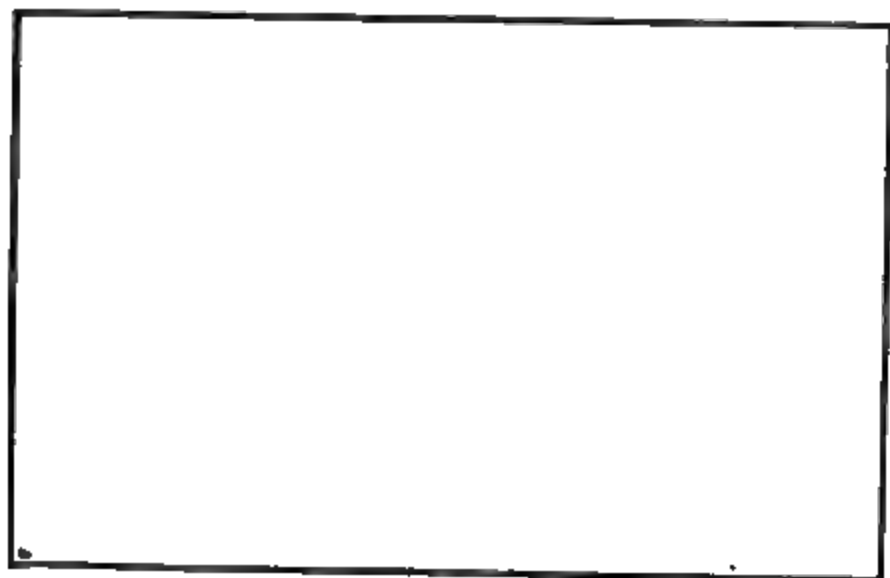


FIGURE 28

FIGURE 30

FIGURE 31

FIGURE 32

FIGURE 27.—Die in articulating frame with bite in place, with one low side-form ready for pouring in plaster of paris to make approximating teeth.

FIGURE 28.—The approximating teeth having been poured up, the high side-forms are put on as this figure shows, ready to pour occlusion.

FIGURE 29.—Side-forms removed and excess plaster cut away, giving clear view of lingual as well as labial surfaces.

FIGURE 30.—Occlusion removed.

FIGURE 31.—All parts removed from articulating frame, to be returned at will during work upon the die.

FIGURE 32.—Enlarged view of articulating frame with die, contacts and occlusion.




FIGURE 33.—The above roentgenograms show porcelain jacket crowns which have been in service over periods varying from 3 to 14 years. While the prints are not very clear they indicate, however, that a pulp under a porcelain jacket crown seems to remain in a healthy state, contrary to the usual condition under a gold crown.

FIGURE 33. (continued).—The above radiographs show porcelain jacket crowns which have been in service over a period varying from 3 to 14 years. While the prints are not very clear they indicate, however, that a pulp under a porcelain jacket crown seems to remain in a healthy state, contrary to the usual condition under a gold crown.

A timed application, with not too much pressure, and the anesthesia carried only to the point where there is little or no sensation in the cavity to be prepared.

If these requirements are met, I see no need, except possibly in some exceptional cases, for anesthetizing the whole trunk of a nerve to prepare a single tooth.

The indirect or impression and model method is especially suited to porcelain inlay and crown operations. The original method of burnishing a matrix directly to the tooth in the mouth was very good theoretically but not practically.

It is entirely practical to secure a very accurate model of a cavity or root, and it stands to reason that a much better matrix can be burnished upon a model in the hand than on a tooth in the mouth.

Greater accuracy in fit is obtained when the matrix can be tested and reburnished on the model after every baking, if necessary.

If we, as operators, can delegate the entire making of an inlay or crown of whatever material we choose to a competent laboratory assistant, we are relieved of much time consuming and painstaking effort, which can be applied to bettering our operations in the mouth. We will perform many operations of restoration, which otherwise would not be attempted. The indirect method makes this entirely possible.

RESTORATION OF PREMOLARS AND MOLARS WITH REFERENCE TO ANATOMICAL FORM¹

By WILBERT J. WHITEMAN, D.D.S.

THE dictionary definition of restore means to make sound and strong again; to bring back to a former and better state; to heal; to cure.

Do we in making restorations, be it inlay, filling or crown, always bear this in mind and try so to form our inlays and crowns that they not only restore the masticatory function, but also heal and cure diseased conditions of the soft tissues and protect them from further injury?

What is the masticatory function of the teeth? The premolars and molars are the teeth which grind the food. During the process of trituration great force is used. If our teeth were not so formed that the food is mechanically shunted away from the interproximal spaces and from the gum septum, buccally and lingually, it would be only a short time before the periodontal tissue would be destroyed by injury and infection, with the eventual loss of the teeth.

In restoring the mechanical function of a premolar or molar, we must, therefore, not only restore the occlusal surface to its highest efficiency, and the occluding planes so that the teeth will not have a tendency to shift, but also reproduce the contour so that the gum septum will be protected in its entirety. The point I wish to emphasize is this: The mechanical function of any posterior tooth is not only grinding of food, but also protecting the gum tissue from injury.

My object tonight is to point out why it is so necessary for us to restore contours, ridges, grooves, etc.

We can prepare a cavity which meets all the requirements of retentive form, resistance form, and extension for prevention, and make an inlay which accurately fits the cavity, but unless we

¹ Read before the First District Dental Society, S. N. Y., Jan. 7, 1918. See disc., p. 157.

FIGURE 1

FIGURE 2

The upper half of Fig. 1 shows the mesial and lingual surfaces of a central and cuspid. Care should always be taken to restore the enamel ridge, to protect the gum tissue from injury. Careful attention should be given to the forming of the lingual surfaces, as the marginal ridges and lingual ridges prevent the food from packing into the interproximal spaces.

The lower half of Fig. 1 shows views of a lower first and second premolar.

The upper half of Fig. 2 shows the correct and incorrect way to contour the buccal and lingual surfaces of a lower molar. In one we have the natural tooth form giving protection to the periodontal tissue, which the other offers no protection and is a menace to the health of the patient.

The lower views of Fig. 2 are shown to illustrate the direction of force during mastication and shows the necessity of proper contour in order to protect the gum tissue.

FIGURE 3

FIGURE 4

FIGURE 5

FIGURE 6

FIGURE 7

FIGURE 8

FIGURE 3.—View of an upper and lower first premolar. The buccal surface of the lower first premolar has a greater slope than any of the other teeth. The point of the buccal cusp being nearly in the center of the tooth. Usually the transverse ridge is not divided by a groove and joins the mesial and distal marginal ridges.

FIGURE 4.—Occlusal surfaces of these teeth. Notice the transverse ridge of the lower is not divided and usually sulci starting in the mesial and distal fossae run over onto the lingual surface, dividing the mesial and distal marginal ridges. The upper first premolar has two cusps well divided by the central groove, ending in the mesial and distal fossae. Notice the "V" shaped sulci radiating from these fossae. These sulci help to shunt the food away from the interproximal spaces.

FIGURE 5.—Two types of the lower second premolar. The buccal surfaces of these teeth have a very prominent ridge. The occlusal surfaces are shown in Fig. 6. The greater number of lower second premolars have two cusps. About twenty-five per cent of these teeth have three cusps, one buccal and two lingual. The buccal diameter of the two cusp type is greater than the lingual diameter, while the lingual diameter of the three cusp type is greater than the buccal.

FIGURE 7.—Mesial surfaces of upper and lower first molars. Note the prominent slope of the buccal surface of the lower ending in the buccal ridge, while the ridge of the lingual surface is near the occlusal third. The greatest bulge on the upper is on the lingual surface.

FIGURE 8. Buccal surface of these teeth. The buccal surface of the upper shows part of the distal surface as the disto-buccal angle is obtuse.

restore the anatomical form of the tooth we do not make a true restoration.

Possibly some of us have a wrong conception of the esthetic side of dentistry. It is not sufficient to eliminate gold from the front of the mouth to have a truly esthetic result. Webster gives the definition of esthetic as "the science which treats of the beautiful in nature."

If we take a molar and study it, how beautiful it becomes. We find form combined with mechanical perfection, and yet sometimes we place in these beautiful teeth hideously formed fillings, and on these roots crowns which have no semblance of nature's original form.

Many times it is necessary to digress somewhat from the natural forms of the teeth when there is malocclusion or malposition. We may find it necessary to form the buccal ridge of the lower premolar or molar more prominently than in the corresponding teeth, or the marginal ridge higher than we usually find it.

The most important thing to remember in posterior restorations is the contact and marginal ridge. It is the way we restore these that affects the protection of the interproximal gum septum from injury and destruction. The importance of restoring the proper contact and marginal ridge is so great that every one who is not thoroughly familiar with tooth forms can profitably spend time in their study. I believe that there is a great difference of opinion in regard to normal contact.

In a paper read before the Panama-Pacific Dental Congress, San Francisco, September 3, 1915, on "Restorations of Masticatory Function with Carved Gold Inlays," and published in the March issue of *Items of Interest*, 1916, Dr. Ottolengui said: "I doubt not that many men mentally conceive little difference between the form, size and position of the areas of contact between bicuspid and between molars. Moreover, I fancy that many men think of the contact as of the contact between two marbles. One has but to glance at any skull containing complete dentures to see that this notion that contact points are spherical in form, or similar in all situations, is entirely wrong."

On the same day, in the same section and published in the

same issue of *Items of Interest*, Dr. E. S. Tracy of Brockton, Mass., in a paper the title of which was "An Informal Talk on Inlays," said: "The normal contact is very small. This fact is frequently lost sight of in operations of restoration, and although the inlay may touch the adjacent tooth, it is often by a surface of comparatively large dimensions. An ideal contact point can be secured by flowing on a little solder at the proper place and rounding it up to a little ball or dome." Possibly Dr. Tracy has changed his views on the marble contact since he read that paper. I have never seen a natural tooth with a little ball or dome as the contact.

The principle of restoring the contact and marginal ridge of all posterior teeth is the same, varying according to the individual teeth to be restored.

If we study any posterior tooth we find the marginal ridge nearly a millimeter from the contact, sloping down into the mesial or distal fossa and rounded down to the contact, and out to the buccal and lingual angles.

This sloping surface to these angles forms a smooth trough for the food to be shunted away from the interproximal space. The contact points are nearer the buccal surface than the lingual, thus forming larger sluice-ways lingually for the food to be more easily shunted into the oral cavity.

The size of marginal ridge and shape of contact is governed, of course, by conditions as we find them. We cannot make a prominent marginal ridge in restorations in teeth that are greatly abraded, but we should always remember the principle, and after studying the occlusion carefully, so form our inlay or crown that food is shunted away and *not* packed into the interproximal space.

The next important thing to remember in crown restoration of the lower premolars and molars is the slope of the buccal surface from the cusps to cervical third, ending in a prominent ridge. The bulge or ridge protects the gum from injury during mastication. When teeth are in normal occlusion the stress of mastication has a tendency to force the food downward buccally and upward lingually, so nature has provided for gum protection by placing this convexity at the cervical third.

FIGURE 9

FIGURE 10

FIGURE 11

FIGURE 12

FIGURE 13

FIGURE 9.—Occlusal surfaces of these teeth. Notice the cusps of the lower first molar divided by grooves, running into the mesial, central and distal fossae. The buccal groove and lingual groove run into the central fossae. The upper molars are rhomboidal in form, the mesio-buccal and disto-lingual angles being acute, while the disto-buccal and mesio-lingual angles are obtuse. The buccal groove runs into the central fossae, while the lingual groove runs into the distal fossae. The triangular ridge of the mesio-buccal cusp connects with the triangular ridge of the mesio-lingual cusp. The mesio-lingual triangular ridge also connects with the triangular ridge of the disto-buccal cusp. This ridge is only partly divided by the central groove.

FIGURE 10.—Two proximal fillings with no attempt made to restore proper contact, marginal ridges and occlusal surfaces. Fillings of this nature are not restorations and are in many cases a menace to the health of the patient.

FIGURE 11 illustrates the contact which would possibly be secured with this kind of filling or inlay.

FIGURE 12.—The same cavities restored in a different manner. Notice how the contact and marginal ridges are formed. With this formation the food will be shunted away from the interproximal spaces. The occlusal surfaces are restored as nature originally formed them.

FIGURE 13 shows the contact as we should have in restorations of this kind.

FIGURE 14

FIGURE 15

The upper half of Fig. 14 shows two premolars and two molars, in proper contact. The lower half shows to good advantage a poor restoration with flat surfaces and no marginal ridge; contact being in line with the occlusal surface, with the possibility of food packing into the interproximal space, resulting in the loss of the interproximal tissue. This slide also shows restorations which mechanically protect the interproximal tissue from injury, as the contact and marginal ridges are so formed that the food is mechanically shunted into the oral cavity.

FIGURE 15 illustrates a poor and a good way to carve cusps. We should avoid forming cusps with too rounding or too sharp triangular ridges, but carve supplementary grooves on both sides of the triangular ridge. We not only restore a better grinding cusp, but also follow nature closely and secure a more artistic result.

FIGURE 17

FIGURE 16

FIGURE 18

So often through early loss of the first molar we have a condition as shown in the upper half of Fig 15. We usually find destruction of the peridental tissue along the mesial surface of the second molar, as the food being forced downward strikes the distal surface of the lower second premolar and is shunted to the gum tissue, and forced backward into the pocket formed by the inclined mesial surface of the second molar. Such a condition should always be corrected in some such manner as shown in this slide. In this case the mesial cusps of the upper first molar are shortened somewhat and an inlay placed in the lower second molar, restoring the contact and occlusal surface as well as conditions will allow. We usually find the lower second molar rotated somewhat lingually.

FIGURE 17 is a cut taken from Martin Dewey's Dental Anatomy. I use this to show the difference in size of contacts. Notice in the molar region we may have a concave surface on one molar and a convex surface on the proximating tooth. Marble contacts are not indicated in these teeth.

FIGURE 18 you no doubt are all familiar with. The occlusion in this specimen is almost perfect. If we could always have this ideal before us and always try to make our restorations to conform to this ideal we would be giving a high degree of service to our patients.

You can readily understand that I cannot here describe minutely each tooth, as a full paper could be written on the description of any one tooth, but will consider briefly the characteristics of the teeth when we study the slides.

Just a word at this time regarding crown restoration of the premolars. For esthetic reasons I feel that when crowns are indicated, porcelain crowns should be used, and that nothing can surpass the porcelain jacket crown and its modification. We can restore the occlusal surfaces in porcelain just as well as we can in gold. It is to be regretted that the manufacturers have not given to the profession premolar and molar porcelain crowns anatomically formed. Dentists who do not bake their crowns are, therefore, handicapped in securing the best results from an anatomical standpoint, since their only solution is by grinding and polishing.

I have tried to point out in this brief paper the most important points to remember in restorations of premolars and molars. We may all have a thorough knowledge of dental anatomy, but do we carry out the natural forms of the teeth in our so-called restorations? For those who wish to make a deeper study of dental anatomy I would recommend that they secure "Dental Anatomy," by Martin Dewey.

Some of you may ask what my technic is for making restorations of this nature. In all inlay, crown and bridge work I use the indirect method, and for me it is much easier and more convenient to make anatomical restorations by this than by the direct method. Furthermore, the greater part of this work outside of the mouth is delegated to *competent* assistants in the laboratory. It is much simpler to carve outside of the mouth, and when it comes to finishing a gold inlay it is easier to sharpen and polish the sulci when the inlay is held firmly in an amalgam die. It is so convenient to go to the lathe and use a brush and pumice without danger of injuring the delicate margins.

THE RESTORATION OF MISSING OR LOST TEETH¹

By A. J. BUSH, D.D.S.,

A SUCCESSFUL prosthetist is one who has a clear vision of the human denture in its completeness and functional perfection, and who in a practical sense has recognized and accepted the normal denture for his guiding principal in prosthetic procedures.

No phase of dental science bears a more direct relation to or shows a greater need for a comprehensive knowledge of the structures and functions of the jaw, alveolar process, periodontal membrane, teeth and dental arches and also the muscles of the lips, cheeks, tongue and mouth, the palate, nasal passages and throat, which assist the teeth in performing their functions than the practice of dental prosthesis, orthodontia not excepted.

While it is not my intention to enter upon a discussion of the structures and functions of the many parts which compose the dental apparatus, I feel, however, that a knowledge of the growth and development of the dental arches from the beginning of the formation of the first dental follicle to the eruption of the last third molar, and a clear understanding of the workings of the forces which govern the position and occlusion of the teeth, and the factors which nature exercises in maintaining either harmony or inharmony in their arrangement and co-relations is indispensable to the prosthetist who attempts to restore lost functions of the dental arches by means of artificial substitutes.

A full complement of teeth in normal occlusion is fundamental to our conception of the highest degree of functional efficiency of the human dental apparatus. Unfortunately, however, according to Dr. Angle, malocclusion of the teeth in some form is almost the rule rather than the exception and is undoubtedly becoming more common as civilization progresses. In

¹ Read before the First District Dental Society, S. N. Y., March 4th, 1918. See disc., p. 170.

FIGURE 1

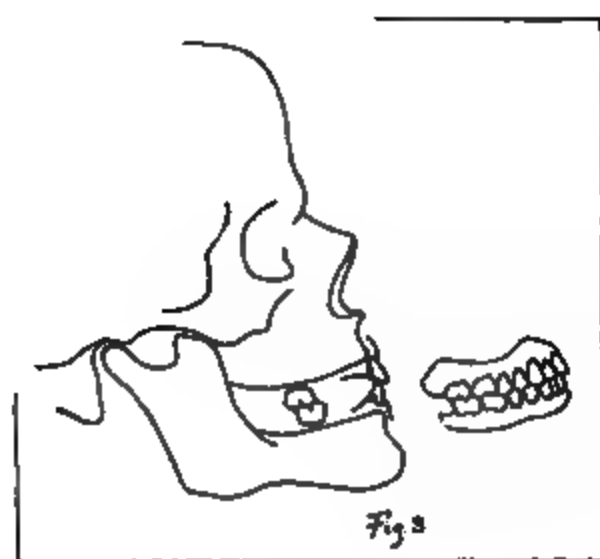


FIGURE 2

FIGURE 3

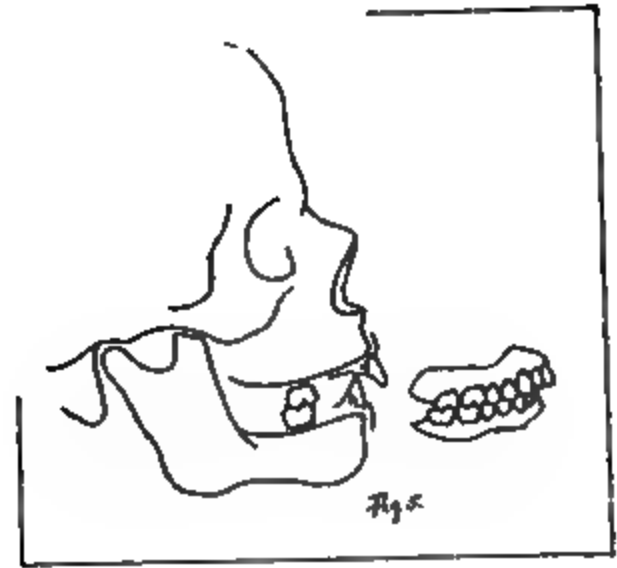


FIGURE 5

FIGURE 4

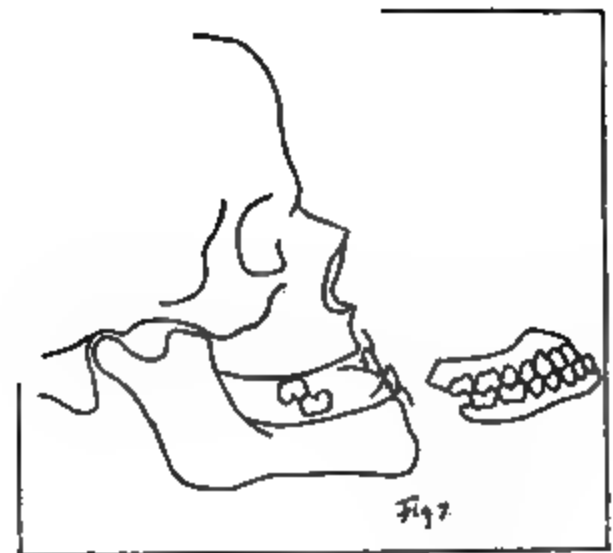


FIGURE 7

FIGURE 6

considering the causes operative in producing malocclusion of the teeth, all authorities are agreed that loss of permanent teeth is one of the most potent.

Dr. Dewey has the following to say regarding loss of the permanent teeth. "Early loss of the permanent teeth produces a large percentage of malocclusions found in adults, and malocclusions will result from the loss of any permanent teeth at an advanced age."

Not only then is the loss of permanent teeth constantly associated with malocclusions which as a class constitute a large percentage of the cases in which we employ partial dentures and bridges, but also there is another large percent of malocclusion cases that have been mutilated by the loss of permanent teeth, but which were primarily caused by other etiological factors. The consideration of this problem of malocclusion therefore, injects itself into every operation performed in dental prosthesis.

Since malocclusion is caused by the perversion of the forces which govern the position of the teeth and since all malocclusions are progressive so long as the forces which caused the malocclusions remain perverted, it is very evident that artificial teeth employed as substitutes for teeth missing from dental arches must be and are amenable to the same forces, and that these artificial substitutes, including the teeth which support them and the teeth in the opposite arch which occlude and articulate with them, must be left free to follow their natural tendencies individually and collectively in accordance with the forces which control their positions and which keep them in harmony with the general arrangement of all of the teeth of both arches which characterizes the type of malocclusion present.

We have been taught and we have been teaching that the artificial substitutes for missing teeth should carry occlusal and incisal surfaces after Nature's plan, placed in normal occlusion and articulation, when we know perfectly well that malocclusion is the rule rather than the exception.

Mutilated malocclusion cases that have been restored by partial dentures or brigework in which the artificial cusps have been placed in full interlocking occlusal contact with the teeth of the opposite arch without regard for the occlusal relations which

should characterize the type of malocclusion which involves both arches, will undoubtedly result in producing a complication more serious than the mutilation caused by the loss of the teeth replaced; and furthermore, the abutments or teeth which give support to such replacements will be subjected to and their loss hastened by a continuous traumatism of conflicting forces.

Failures from this cause, especially in connection with fixed bridgework and also in connection with some of the less movable types of removable work, are more numerous than commonly believed.

The normal should not be used as a pattern in restoring a break in the continuity of an abnormal arch any more than the abnormal can be used as a pattern in restoring similar breaks in the continuity of a normal arch. In other words the normal is just as incompatible with the abnormal as the abnormal is with the normal.

This, however, is meant to apply to the restoration of missing teeth only in so far as the formation of their occlusal and incisal surfaces are concerned and more especially to their position in the same arch and their relations with the teeth in the opposite arch.

The size, form and interdigitating surfaces of the teeth restored, therefore, should not only duplicate those which were lost, but also their position and arrangement, in so far as possible, should be the same as that which characterized the former positions of the missing teeth, according to and in harmony with the normality or abnormality which characterizes the general arrangement of the teeth before they were lost.

It is well to recognize, however, that the success which will attend our efforts in artificially replacing teeth missing from dental arches in malocclusion or rather the success of restoring lost functions of the dental arches resulting from lost teeth, is subject to and cannot exceed the limitations imposed by the character of the malocclusions involved. It is also well to recognize that the fullest degree of success in restoring lost functions can only be achieved after the remaining teeth have been placed in normal occlusion; for then and only then is it possible to replace the missing teeth by bridgework or partial dentures in harmony

with the line of occlusion and with the forces which govern the normal position of the teeth and to restore the dental arches in accordance with our conception of the highest degree of functional efficiency.

Thus far I have discussed the principles of occlusion as applied to bridgework and partial dentures only and have endeavored to show that the functional value of these forms of artificial substitutes is determined by the character of their occlusal relations with and according to the occlusal relations of the natural teeth remaining in the dental arches.

The application of the principles of occlusion to the restoration of edentulous jaws will be discussed from the standpoint, that, if the articulating surfaces in the condyles and fossae, the muscular action and the habitual masticating movements of the jaws are determined by the articulation of the adult natural teeth, then so also must be the artificial teeth articulated in order to enable the patient to continue habitual masticating movements which were established prior to the loss of the natural teeth.

It may be difficult to diagnose malocclusion as having previously existed in an edentulous mouth but generally by closely studying the mouth in its relation to the other features and by observing the relation of the mandible to the maxilla, a definite opinion can be formed regarding the occlusion of the previous dentition.

Dr. Angle states that "Notwithstanding that the effect on the facial lines of the varying forms of malocclusion found in the three different classes varies not only with the degree of malocclusion, but somewhat with the individual type of face, yet the facial deformity produced by the malocclusion in each class is so distinctive and constant that after some practice the orthodontist may even classify with considerable accuracy the malocclusion of the people he meets without an actual examination of their teeth.

"So, also, the loss of teeth produces such distinctive disturbances of the facial lines as to make diagnosis from them alone often easy. One interested soon finds himself making mental diagnosis of malocclusion and classifying facial deformities whenever and wherever he sees new faces."

If the facial deformities produced by the malocclusions in each class are so distinctive and constant, that after some practice the orthodontist may classify with considerable accuracy the malocclusion of the people he meets without an actual examination of their teeth, and if these facial deformities which are so distinctive and constant will but retain their status quo after edentation, then by the same acumen the prosthetist should be able, after some practice, to make the same diagnosis.

Whether we agree or do not agree that the habitual masticating movements of the jaws are determined by the articulation of the adult natural teeth and whether we do or do not admit that the artificial teeth should be articulated so as to enable the patient to continue habitual masticating movements which were established prior to the loss of the natural teeth, and whether the patient shall be enabled to continue these movements which are probably the most efficient he will ever have, or whether these movements shall be destroyed by constructing dentures in normal occlusion; aside from all this, aside from these considerations which more especially concern the probable masticatory efficiency of artificial denture, we must remember according to Dr. Angle—"That the dental apparatus is not an organ with but a single function, like the eye or the ear, but that it is a very complex structure, with many functions into which enter not only the jaw, dental arches and teeth, but the muscles of mastication, the lips, tongue, nasal passages, palate and throat, and that in addition to the function of mastication they are also concerned in the vital function of respiration and also in speaking, singing, whistling, laughing, crying—in short in the expression of all the various emotions."

If the different parts and combination of parts entering into the performance of these various functions and acts are so intimately associated that even slight inharmony in the growth and development of any one may ultimately involve the whole apparatus, interfering with the normal function of all, then must we not be concerned in providing artificial dentures that not only will be in accord with the development of the associated parts, but also in accord with the performance of their various functions which have become modified, especially the function of masti-

cation, and also all functions or emotions that involve the tongue and lips?

We can find additional reason for articulating artificial teeth after the general plan of the occlusion which was the rule previous to the loss of the natural teeth in the study of facial art.

Perfection or deformity of the human face largely depends upon the occlusal relations of the teeth.

Facial deformities produced by the malocclusion in each class are characteristic of and vary with the degree of malocclusion.

If taken in time the orthodontist may correct the malocclusion and nature will renew her efforts toward the development and growth of all the related parts, and in time establish full harmony of these parts, according to Nature's plan. But on the other hand, if malocclusions are permitted to progress until late in life, and the teeth ultimately lost after the deformity of the face and jaws is permanently established, then they are beyond the skill of the orthodontist and it is not within the province of the dental prosthetist to reclaim opportunities lost to the orthodontist.

By referring to Fig. 1 (Angle) you will quickly recognize that this finely molded face with its firm chin and mouth, was developed in harmony with a normal denture. It is correct practice and in accordance with the principles of harmony as applied to the teeth and face, to make artificial dentures for an edentulous case like this, with teeth in normal occlusion, in order to maintain the perfect balance of the face and jaws and especially of the lips which were molded over teeth in normal occlusion and in fact in all cases in which normal occlusion of the natural teeth was the rule prior to their loss.

It would be interesting to know what percent of people reach adult life with a full complement of teeth in normal occlusion and subsequently become edentulous, but since normality of tissues in general predisposes to their health and longevity and since malocclusion is the rule rather than the exception, it would seem safe to assume that the greatest percentage of edentulous jaws is yielded by those cases which were in the beginning or during their

development period, associated with maldevelopment in some form.

Out of several thousand cases of malocclusions examined by Dr. Angle, the proportion per thousand belonging to each class was as follows: Class 1, 692; Class 2, 266; Class 3, 42.

Class 1, Fig. 2, (Angle) is characterized by normal mesio-distal relation of the jaws and dental arches.

In making full upper and lower artificial dentures, for individuals who have malocclusion of this class and who have subsequently become edentulous, it is unquestionably proper to place the first molars in normal mesio-distal occlusal relation, i.e., in the relation which characterizes the relation of the jaws, and all of the teeth should be articulated and given positions in relation to the line of occlusions consistent with the facial peculiarities, especially those of the lips, which characterize class I cases as shown in Fig. 3.

Class 2 cases are differentiated by the lower arch being distal to normal in relation to the upper arch. According to Dr. Angle, about 25 percent of all cases of malocclusion fall within this class and furthermore, that substantially 33 percent of this class fall within Div. 1, Fig. 4, (Angle) which division is further characterized by protruding upper incisors and undeveloped lower jaw and chin. All Class 2 malocclusion cases, especially Div. 1 which is the most extreme malocclusion of this class, which became edentulous in adult life, cannot be treated as normal occlusion cases, for if the articulating surfaces in the condyles and fossae, the muscular action and the habitual mastication movements of the jaws are determined by the adult natural teeth, then, so also must the artificial teeth be articulated in order to enable the patient to continue habitual masticating movements.

Fig. 5 shows upper and lower artificial dentures articulated as Class 2, Div. 1.

Facial deformities produced by malocclusion in Subdivision Div. 1, Class 2 and Div. 2 and Subdivision, Div. 2, Class 2 should likewise be diagnosed and the edentulous jaws restored with artificial dentures articulated according to the classification and degree of malocclusion involved.

About 4 percent of malocclusions are Class 3, Fig. 6. This

malocclusion is characterized by mesial occlusion in one or both halves of the lower dental arch with a corresponding facial deformity and mesial inharmony in the relation of the mandible to the maxilla.

Fig. 7 illustrates the relation of the mandible and maxilla and shows the mesial occlusion of the lower artificial denture indicated in Class 3 Division.

Though a full discussion of the "Restoration of Lost or Missing Teeth" necessarily involves the consideration of methods as well as principles, nevertheless I have acted upon the assumption that my treatment of the subject assigned by your chairman would be in better harmony with the intention of and the general treatment accorded to the other subjects of your symposium, if my remarks were confined to a consideration of some of the principles of occlusion which govern prosthetic procedure and methods which are employed to restore dental apparatus to the fullest degree of functional usefulness.

State St., Cor. 6th, Columbus, Ohio.

SEVENTH ANNUAL JOURNAL CONFERENCE

ON the afternoon and evening of Saturday, April 13, 1918, at the Hotel Vendome, Boston, Massachusetts, was held a meeting that is always anticipated with pleasure by those friends of the JOURNAL who have attended before, the occasion being the Seventh Annual Conference of the Editorial Staff, the Board of Directors of the new corporation, the various editors and the friends of the JOURNAL in general.

Following the arrival of some late comers from New York, about four o'clock, the genial Dr. Rice, who is a perennial chairman by common consent, called the meeting to order with a few remarks of welcome to the visitors. The minutes of the previous conference were read as published in the June, 1917, issue of the JOURNAL, and adopted without alteration.

Dr. Dunning took the floor and gave his annual report, containing many interesting details of the incorporation of the Association of the Allied Dental Societies. He read the articles of incorporation, as published in the March, 1918, JOURNAL, and the new by-laws, as adopted by the Board of Directors.

He mentioned among other details, some of the difficulties of publication imposed by war conditions, high paper and labor costs, etc., and referred to the friendly rivalry of the only other independent Journal, that of the National Dental Association.

The Treasurer, Dr. Karl C. Smith, unable to be present, was represented by the accountant of the corporation, Mr. W. B. Hutchinson. On motion, duly seconded and carried, the report was accepted and ordered filed.

Dr. S. E. Davenport read his report as Chairman of the Publication Committee, which was listened to with great interest, giving as it did many enlightening details as to the cost of publication of the various issues and showing an actual decrease per issue, remarkable as it may seem under present conditions.

Dr. Davenport also reported that the Journal's Service Flag already contains four stars, representing our members in Uncle Sam's service, as follows:

Drs. C. F. MacDonald, Jr., C. G. Fletcher, B. B. Palmer, Jr. and Matthew Carney, all now in France.

Dr. S. Ellsworth Davenport, Jr., has received his commission and awaits assignment to duty.¹

After some other general remarks, Dr. Davenport closed his report by stating, (with pride, he said), that all eleven of the New Yorkers present were either active or sustaining members of the Corporation.

Dr. Richburg announced that the Metropolitan District of the Massachusetts Dental Society, one of our supporting allied societies, had increased its membership by 127.

Dr. Davenport, Jr., rose at this point to make a strong plea for the securing of new sustaining members at the prescribed fee of ten dollars annually, such dues to be used to increase our special funds for the general good of the Journal.

After interesting expressions of opinion by Drs. Eugene Smith, Merritt, Lindstrom, Piper, Proctor and Tracy, Dr. Abbott so enthusiastically outlined some ideas for the increase of circulation and improvement of the Journal, that he was unanimously appointed, by vote, chairman of a committee to obtain new members for the corporation. He was also authorized to name and organize his own committee.

Among those present at this session were noticed the following: Drs. Rice, Dunning, the Davenports, Wheeler, Tracy, Waugh, Collins, Lindstrom, Richburg, Proctor, Potter, Kemple, Merritt, Jackson, Barrett, Arthur Doubleday, Eaton, Abbott, Piper, Ainsworth, Boardman, and Eugene Smith.

Following shortly afterward, and through the friendly courtesy of the Boston men, a fine dinner was tendered the New York guests, and a most enjoyable evening was spent discussing the items of the menu, and listening to the toasts given as follows:

TOASTS

WELCOME TO NEW YORK GUESTS

WILLIAM RICE, D.D.S., D.M.D.

Dean Tufts Dental School

PROFESSIONAL JOURNALISM

HERBERT L. WHEELER, D.D.S., Professor of Prosthetic Dentistry, College of Dental and Oral Surgery of New York.

¹ Since assigned to active duty.

SOME RECENT DENTAL RESEARCH

PERCY R. HOWE, A.B., D.D.S., Director in Charge of Dental Research at the Forsyth Dental Infirmary.

THE JOURNAL

WILLIAM B. DUNNING, D.D.S., Editor of "The Journal of the Allied Dental Societies."

THE AMERICAN DENTIST IN THE GREAT WAR

FRANK H. CUSHMAN, B.S., D.M.D., 1st Lieut., D. R. C., Member of Boston City Hospital Unit. Member of 2nd Harvard Surgical Unit.

LOYALTY

SEBERT E. DAVENPORT, D.D.S., M.D.S.

Friend of the Journal

The subjects covered were from grave to gay, from pessimistic to optimistic, principally the latter; they took in incidents in the life of the great Miller, some modern experiences behind the lines of the great war, some developments in dental journalism, some pathology of root canals, and silver precipitation therein, and they ended with patriotism; which was right and proper.

So passed another Conference.

Respectfully submitted,

LELAND BARRETT,
Secretary.

ATTACHMENTS TO VITAL TEETH¹

BY EDWARD T. TINKER, D.D.S.

PART I

THE late Dr. Wassal, some twelve or fourteen years ago, presented a paper at Washington in which he described the gold shoulder crown. These crowns were all placed upon devitalized teeth, using a burnished matrix and building the contour after the inlay technic of that day. At that time, I was doing considerable work along the line of restoration in mouths affected with pyorrhea. The banded crown had always been a source of trouble and never quite filled the requirements, principally from the fact that, where used, further prophylaxis was practically prohibited.

When Dr. Wassal stated that with his method he could produce margins whereby the continuity was preserved between the root and crown surface, it appealed to me, and consequently I adopted the method. At that time we did not recognize to the fullest extent the relations between mouth foci and systemic conditions. However, we did consider the relation between pyorrhea and systemic disturbances long before the realization of infected apical areas attained their full significance.

It remained for later years, with the assistance of the X-ray, to show the conditions that existed in those areas above the roots, so that it has come to a point now where the devitalization of a tooth, done simply because the pulp is in the road, is a thing that is discountenanced by most of us, and any method which will preserve the tooth, or teeth, in their natural state, as far as the pulps are concerned, is the one we should accept.

When Dr. Taggart gave us his invention I found that it was possible and entirely feasible to apply it to bridge abutments, which could be used almost indiscriminately on vital teeth.

I shall not attempt to cover the entire field of crown and

¹Read before the Section on Crown and Bridgework, 1st District Dental Society, S. N. Y., April 17, 1918. Simultaneous publication with *The Dental Review*.

bridge work, as it is a subject so large as to make it impossible to cover any one phase of it in one evening. I use removable bridgework. I also use inlays as bridge abutments. This evening, however, I will devote entirely to a few slides illustrating full and partial crowns, their application and methods of construction as applied to vital teeth.

FIG. 1. We will take up for consideration the full crown, meaning the crown which extends beneath the gingiva to every point. I show it first because it is the least used of any attachment, being indicated in very short teeth only. Teeth where this crown is generally indicated include lower third molars, upper third molars, occasionally lower and upper second molars, and lower bicuspid where the lingual cusp is so short as to practically give no frictional wall to resist the force of mastication.

The usual objection to the application of a full gold crown on a vital tooth does not obtain when we apply them as they are indicated, from the fact that we do not encounter bell-shaped crowns in these instances. Forms of crowns for those types of teeth will be shown subsequently.

The technic of preparation will apply largely in a modified form to all the subsequent preparations, and the one point which I wish to drive home and make you clearly understand is that the word shoulder as here applied is clearly a misnomer, and is only used for want of a better term. If you can grasp the idea and fix it firmly that this shoulder is the very last part of your preparation to be heeded, you will have grasped practically the proper preparation for the gold jacket crown.

The technic I will state briefly. First, with a vulco-carbon disc cut both mesial and distal contact points away, making at the same time a shoulder just beneath the gingiva the thickness of the stone used. Now with a smaller stone of the same type you are enabled to dress back both mesio and disto buccal and lingual angles. With a cylinder-shaped stone, remove buccal and lingual enamel to the point from where you wish your crown to draw. Then with a very small stone of the same type, definitely outline the shoulder which in many instances amounts to nothing more than a line simply deep enough to allow a flush joint with the periphery of the root. As to the occlusal surfaces,



FIG. 1

FIG. 2

FIG. 3

C

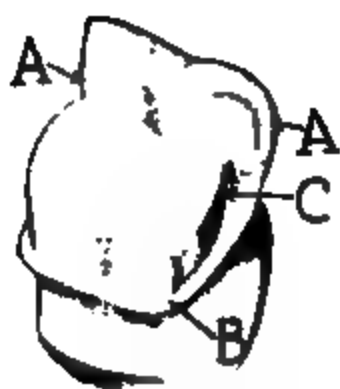


FIG. 4

FIG. 5



FIG.6

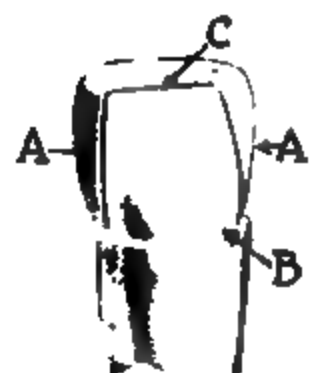
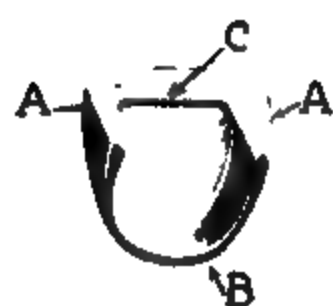


FIG.8

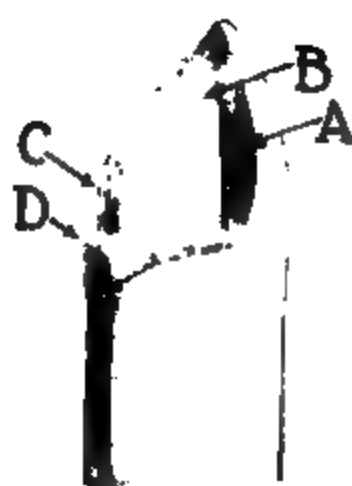


FIG.7



FIG.9

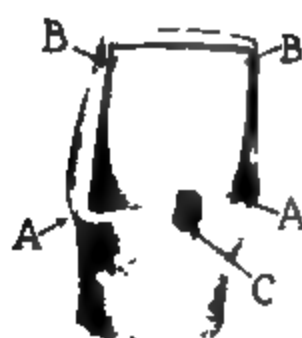


FIG.10

they should never be ground flat except in teeth where from natural attrition the cusps are entirely worn away, for in all cases where you have ground the occlusal, its general shape should conform to the tooth before preparation was started. In other words, a millimeter to a millimeter and a half gives sufficient thickness for the gold in the majority of cases. This thickness should obtain through the fissures, transverse grooves and pits, as well as on the tips of the cusps. You have everything to gain and nothing to lose by following in detail the foregoing thoughts. You will gain sometimes as much as half of the length of all frictional walls from the gingiva to the incisal edge. Obviously you will add protection to the horns of the pulp which is a very important consideration.

Fig. 2. Type used where we have bell shaped crown, but necessary as in the case of pitted enamel or any other reason which makes protection of the cusps imperative. Treat mesial and distal surfaces same as in the full, extending the buccal and lingual margins only so far gingivally as to encounter sound enamel and complete the circle of the tooth.

Fig. 3. The most common type of attachment used on an upper molar tooth, namely a three-quarter crown. This utilizes every surface excepting buccal, which you generally find in a healthy state on these teeth, making the sight of gold no more conspicuous than an ordinary mesio-occlusal inlay.

Fig. 4. Merely one of technic to impress the fact that the shortest distance mesially should be from A to A and the longest from B to B, to guard against lingual displacement. In order always to attain this desired feature remove just as little enamel from the mesio and distolingual angles as is possible and make these walls parallel, allowing the crown to draw from the gingiva. Just as much as we, by careless procedure, remove in excess of that which is necessary, just that much closer must we bring our axial walls at A to the pulp. This rule not only applies in a three-quarter molar crown but in any three-quarter which I shall subsequently show.

Fig. 5. A typical attachment for a lower first or second molar, especially a second where the first has been removed and the second moved forward and to the lingual, creating a difficult

situation. The lower molar is the only tooth where the buccal surface is the surface used in addition to the mesial and distal with the construction of the three-quarter crown. In many cases were we to attempt cutting back the lingual cusps to a point allowing the removal of the full crown, we would endanger the pulp and be very apt to have future trouble. In these cases we only extend the lingual margin far enough gingivally to complete the encircling of that tooth. All other margins in the great majority of these teeth treated, must extend beneath the gingiva.

Fig. 6. Typical bicuspid.

Fig. 7. Typical cuspid.

Fig. 8. Typical central. Lingual aspect.

Fig. 9 is illustrative of the proper position for the grooves on the mesial and distal surfaces. When we recognize that these are the all important points of retention for any type of a three-quarter crown, we must understand that their proper position must be fully as important. A very natural mistake is to place them parallel with the long axis of the tooth. This, however, is entirely wrong, for on account of the gum septum, it is the shortest distance from the cutting edge to the gingival margin. The proper position for this groove is from A to A, paralleling the labial plates and terminating the groove in the extreme mesio—and disto-labial angles, and automatically making the preparation self-cleansing, and giving practically one-third longer retention. By so doing we also come as near completing the circle around the lingual to the same point on the opposite side of the tooth as is possible and still retain the labial plate of enamel undisturbed. They also automatically parallel the abutment with any posterior abutment of the same bridge, as in a normal set of teeth the central incisor tips labially to the incisal surface, the lateral a little less, cuspids still less and bicuspids practically perpendicular.

Fig. 10 illustrates the only position where I deem pin retention necessary and advisable in crown attachments. There are certain types of teeth with which to contend where there is no pronounced cingulum, and where on the contrary, the lingual contour from the gingiva to incisal is one convexity. In these cases we would have to depend entirely on the two grooves for retention, but we are able to utilize a 20 gauge iridio-platinum threaded

pin in the lingual pit, giving what practically amounts to three dowels.

PART II

SANITARY DUMMIES

When Dr. Hunter condemned modern dentistry with a special reference to that work done by American dentists, referring more particularly to crown and bridge restorations as they were generally constructed, there is no doubt that he had good grounds for his opinion, and it is due to him and other investigators, that both the profession and the laity have come to look upon mouth restoration from a different angle.

Formerly, the uppermost thought in the minds of the operator was something to chew on as well as to fill the spaces made vacant by the loss of teeth, but in the past few years we have developed two distinct types of bridgework, namely, removable and fixed.

There is a large percentage of the profession which believes that each type has its place in dentistry and should be used where indicated. When a case presents in which either type may be used, the principal advantage claimed for removable bridgework is sanitation.

A certain proportion of us are of the opinion that a fixed structure cannot be placed and the soft tissues kept in a sanitary condition. With that proportion of the profession I wish to take issue, for I know by clinical experience that such an indictment is entirely uncalled for and cannot be substantiated when the proper construction of fixed dummies is carried out.

We cannot construct dummies by the old method of setting our facings high on the labial side of the ridge, producing a shelf on the lingual surface with no regard for interproximal spaces, tooth form, contact points and embrasures, and proper occlusion, without which, no bridge, no matter what type of construction, can be successful.

We will all admit that porcelain produces the best occlusal surface from a masticating standpoint, but we must also grant that porcelain in contact with the gingival tissues, comes nearest to

producing a condition of perfect health than any material outside of the natural tooth itself.

Consequently, any dummies which I shall show in the accompanying cuts, will have entire porcelain contact with the gum, and gold occlusal surfaces as I believe that the lesser of the two evils caused by the gold, should better be borne by reduced masticating surfaces than unhealthy gingival tissues.

I shall take up first, the replacement of teeth where extractions have been made previously, and the gum tissue is in a healed state. Fig. 1 is largely self explanatory. Select facing, "A," and contour the length of the tooth which was extracted. In the average case this will be approximately two-thirds the length of the space to be filled by the dummy. Bevel the gingival third of the labial surface in a line, bringing the point of the porcelain tip "B" to approximately the top of the ridge or slightly labial to it. Grind facing "C" on both mesial and distal from about the point paralleling the pins, so that a slightly convex line drawn from that point to the apex will give the proper interproximal space "D." Take porcelain with a fusing point of 2300 degrees, build it to an excess on the facing, and bake to a high biscuit. Grind to fit the model, place back in the furnace and carry to an overbake, remembering that this porcelain tip is merely to produce a sanitary condition, and that it adds nothing whatsoever in the way of strength to the bridge. Consequently, porcelain baked to an impervious surface for this work, would be ruined were it baked to the same degree for an inlay or crown, and if at any time before completion and setting of bridge, this roof surface becomes roughened by grinding, it must be reglazed, as there is no method by which it can be polished high enough to prevent the absorption of the fluids of the mouth, thereby becoming just as much an irritant to gingival tissues as an etched enamel surface on a natural tooth. "E," "F," "G," "H" represent the gold occlusal attachment completing the dummy.

Fig. 2 represents the proportion of our dummy from occlusal to gingiva, which will be occupied by the gold and porcelain.

Fig. 3 gives us approximately the proper shape of a dummy, its contour, point of resting upon the gum and interproximal spaces. Under normal conditions, the soldering joint should in-

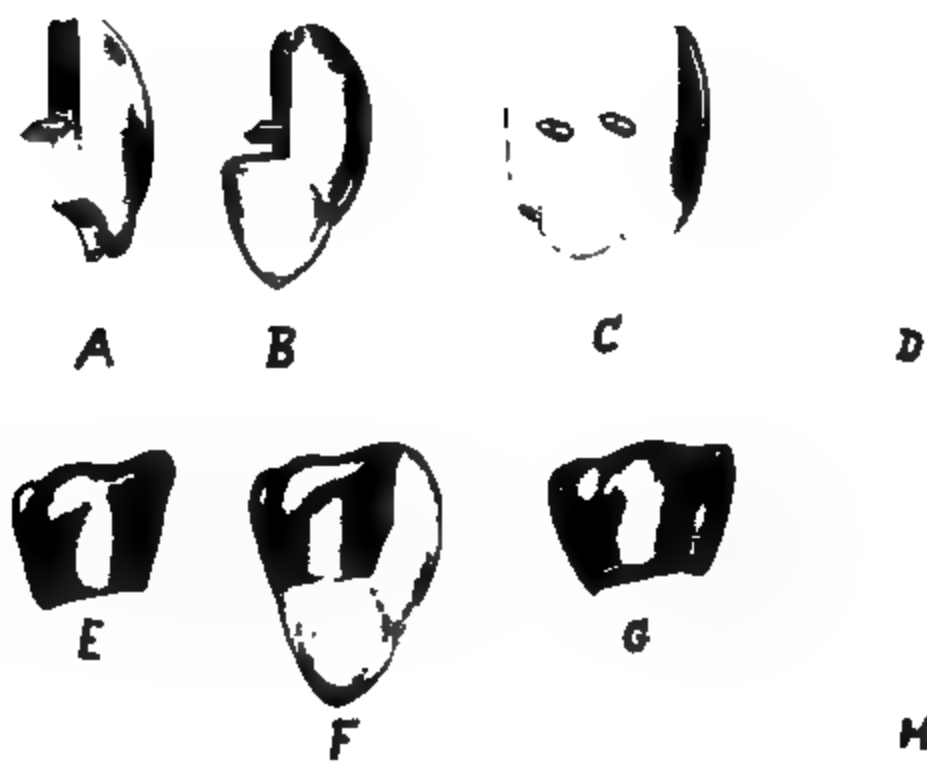


FIGURE 1

FIGURE 2

FIGURE 3

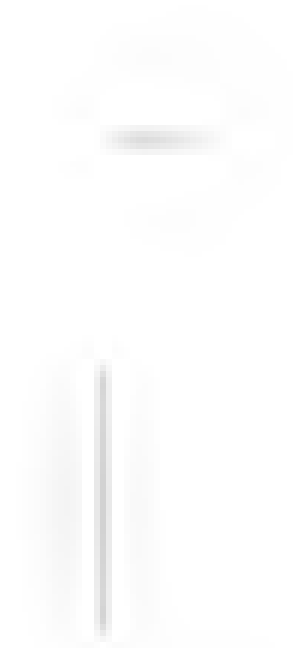


FIGURE 4

NOTE.—X-ray illustrations of porcelain-tipped dummies which have been in place for some time.

clude the occlusal third, the interproximal space occupying the middle and gingival third. Every surface of these dummies is convex excepting the extreme occlusal point of interproximal space. They should be so constructed, that with the aid of the tooth brush and silk tape, the patient is enabled to cleanse every surface. No full denture, removable bridge or fixed structure will be any more wholesome and sanitary than the wearer is pleased to keep it, and it is up to us as dentists to produce restorations which can be properly cleaned.

When a bridge is to be constructed involving any of the bicuspid or six anterior teeth, and extractions have not been made, my favorite method of replacement is to insert porcelain roots from 1-3 to 1-2 the length of the root of the natural tooth, having the bridge entirely constructed before such roots are extracted. Place the bridge in position at the same sitting that the teeth are extracted, being sure that the socket is thoroughly curetted at the time of extraction.

One essential feature of this work is that the porcelain root must take the shape and entirely close the orifice of the root socket, tapering from beyond this point to the root tip. These cases are attended with excellent results when there is not extensive necrosis. Very little absorption takes place. The gum tissue hugs the porcelain root very closely and remains in an exceedingly healthy state, in fact many cases of over three years' service can hardly be distinguished from the abutment adjoining, mainly because of the way in which they have reproduced facial contour.

I will mention a few details of construction. Prepare abutting teeth and make the abutments. Fit them in the mouth and take an impression in modeling compound, by the core method, of all teeth in that mouth. Remove abutments and place them in position in the impression and run. Mount full case on anatomical articulator. Study the roentgenogram of roots to be replaced. Approximately outline on the labial surface of the model with a lead pencil the direction and length of such roots. With a sharp lance cut away the crowns, definitely outline gingival margin and excavate sockets of the model to approximately 1-3 to 1-2 length of the root. Proceed to grind facing in position.

Bake on porcelain root and carry to high biscuit, grind to fit socket and glaze.

That part of the construction does not differ from any other bridge excepting in this way, that on the lingual surface of these dummies, it is best that they should conform to the anatomy of the teeth they are to replace. When the roots are extracted, try the bridge in position first without the porcelain roots to be certain no warpage has taken place during its construction. Remove and place facings in their respective positions without cement, and replace in the mouth. Should the roots bind at any point dress with a stone, after which reglaze and cement to the bridge. Set the bridge with gutta-percha stopping temporarily. It is my practice never to cement one until from one to three weeks have elapsed after extraction, for the reason that I may encounter secondary infection, and were the bridge cemented, a great deal of trouble would result.

When you have determined that the tissues are in a healthful state, remove bridge and thoroughly sterilize the sockets with iodine and the bridge with a 50% alcohol solution, and cement, being careful that nothing comes in contact with the porcelain roots which might possibly carry infection into the sockets.

Where we have one tooth to replace and the tooth on either side not affected with pyorrhea, it is a good practice to use simple inlays or some other form of inlay attachment, soldering the dummy to the distal one only, and making a socket on the distal contact point on the anterior inlay. The diameter of this socket is slightly larger at the orifice than at the bottom, rendering a slight movement of each abutment possible without bringing any stress on either one, in other words breaking the stress between the abutments, a feature you all must realize as being invaluable up to a certain point and in any case where two or more teeth are tied together. The construction of this work is very simple and the only features necessary for me to enlarge upon are the taking of the impression and the making of the model. Take the impression with modelling compound, the reason for which you will see later. Seat your impression in the mouth and while the modelling compound is in a moulding state, remove about 1-3 the distance away from the teeth, repeating this at least twice, in order

that all undercuts may be broken. Now hold the impression firmly in position until entirely hard. Remove abutments and place in their positions in the impression. The inlay which carried the socket must have a very thin film of wax melted over its cavo surface. Mix that quantity of technic cement and pour the impression of the tooth carrying this inlay, including one or two anterior to it. Place a tack in it before it hardens. The rest of the impression pour with any good soldering investment compound. When the model is separated apply hot spatula to inlay in the cement tooth which will melt the wax and allow you to remove the inlay from the cavity. This must be done for the reason that when the dummy is carved in wax, including the lug which rests in the socket, in order to remove for investment and casting, the mesial inlay may have to come also, and then be separated from the wax dummy.

After this is cast, fit to this inlay, replace on the model, wax to distal inlay and solder. This idea can be used in many diversified ways in small bridge restorations, for it has its advantage over the old type of the rest bridge from the fact that there is no lost motion giving undue stress on the abutment which carries the dummy. It can be controlled for each individual case by the taper given the lug. The more taper the more motion, the reverse being true also.

Donaldson Bldg., Minneapolis, Minn.

THE IMPORTANCE OF BACTERIOLOGICAL FINDINGS IN RELATION TO THE TREATMENT OF INFECTED TEETH

By MONTGOMERY LA ROCHE, D. D. S.

THE greatest importance is attached to the teeth as a possible source of systemic disease. The dental profession and the world at large are having that fact pounded into them every minute by the great accumulation of evidence which is piling up day after day.

It is therefore bootless to go into the details of this evidence in the present article, but we must ever keep before us the prime importance of what we are doing in our daily work.

In dealing with dead teeth we must not be guided by the X-ray findings alone. There is no denying the fact that these leave much to be desired, however necessary to our work they may be. In fact, too much cannot be said about the importance of good roentgenographic work in connection with the treatment of these teeth, although it must not be forgotten that we are dealing with microscopic not macroscopic beings, primarily bacteria. And unless they have been there a long while and their action while there has been of a certain character, the result of their presence will not be exhibited in the roentgenogram. In any case the germs themselves will not be seen.

We are further confronted with the fact that after a certain amount of attempted sterilization of an infected root we are at a loss for proof of absolute sterility. We know through sad experience that lack of pain is no indicator. We know further more that the X-ray does not always indicate the presence or absence of microorganisms. Where then are we to turn for proof, for proof, absolute and unquestioned, we must have. Otherwise we are not justified in treating these teeth.

Rhein claims that upon the injection of hydrogen peroxide into the root, the absence of bubbling indicates sterility. But is that *absolute proof*? Does that indicate the condition at and be-

yond the apex? He does not claim it does, and we must look further.

Up to the present time there has been developed nothing better for the purpose, so far as I have been able to ascertain, than the actual bacteriological findings, carried out in conjunction with the proper technic. In proceeding with the fact in mind that we are dealing with things invisible to the naked eye, we must not forget that there are germs constantly on our hands, in the air, on the bracket table, in our cabinets and in fact everywhere, and we must therefore be sure that everything that goes in that tooth is absolutely sterile. Sterilize the outside surfaces of the tooth, the adjacent parts of the dam and clamp, washing them off thoroughly with alcohol and iodine, being sure the alcohol has thoroughly evaporated before applying the iodine.

Open the pulp chamber carefully, using nitrate of silver to swab it out before opening the root or roots. Remove the debris in these roots as far as possible, using utmost care not to push any through the foramen and also observing strict sterility throughout, not touching the ends of the instruments with the fingers and using a little sulphuric acid or sodium-potassium. It is not desirable to open the roots and cleanse them at once if one wishes to ascertain the nature of the infection, at the start. I find this to be an advantage in checking up later on in the treatment. This course is purely optional however, and modifications are perfectly in order, especially where persistent pain is present.

Now we come to the crux of the whole subject. It is right here that the microscope and artificial media become necessary, and we are also confronted by a rather peculiar and puzzling fact, *viz.*: that it is a very difficult matter to get a culture from an infected root. I have placed broaches, platinum wires and loops into the canals and pulp chambers and obtained indifferent results, even when there was pus flowing from them. I have placed beef broth in the roots for a few moments and removed it under sterile conditions, with a little better results perhaps, but still unsatisfactory. I have placed sterile paper points in the roots, sealing them in for days, with very unsatisfactory results. I have therefore come to putting glucose broth in the roots, in-

jecting it into them with a syringe, sealing sterile paper points in them, saturated with this broth, for 48 hours, and removing the paper points to a sterile glucose agar slant, which is incubated about 24 to 48 hours, and if there are germs there I get them. They cannot resist this tempting treatment.

I hope I do not seem monotonous in constantly harping on sterility, but we as dentists have not been trained to the necessary precision in that direction. I should highly recommend a post graduate course in bacteriology as being not only instructive in itself, but as serving as a ground work for the understanding of the necessity for and meaning of absolute asepsis.

If we have followed out carefully the technic outlined above, we make our results absolutely sure, taking the newest, most far-reaching and most important development in modern medical and dental science, the actual elimination of foci of infection, out of the realms of uncertainty and guess work and placing it in the bright light of scientific knowledge. We cannot go wrong and therefore we must not continue to do as we have been doing in the past. We must not neglect the open door of opportunity at our elbow, but we must eliminate all doubts in our work. Our patient's health is at stake and when we once realize the importance of our work, no task can be too exacting, no care too great.

704 Madison Ave., N. Y. City.

REPORTS OF SOCIETY MEETINGS
FIRST DISTRICT DENTAL SOCIETY OF THE STATE
OF NEW YORK, JANUARY 7, 1918

A regular meeting of the First District Dental Society of the State of New York was held on Monday evening, January 7th, 1918, at the Academy of Medicine, No. 17 West 43rd Street, New York City.

The President, Dr. Charles F. Ash, occupied the chair, and called the meeting to order.

The first paper of the evening was read by Dr. Edward B. Spalding, of Detroit, and was entitled "Restoration of Portions of Teeth."¹

Dr. Wilbert J. Whiteman of Detroit read a paper entitled "Restoration of Premolars and Molars, with Reference to Anatomical Form."²

Discussion

Dr. Henry W. Gillett—I want to talk particularly along the line that Dr. Spalding did concerning the restoration of the normal occlusal surfaces in porcelain work. We have considered normal restorations in our gold inlay work until it seems to me the subject is getting just a bit worn. To be sure, we still have with us a great many men who seem either incapable of developing ideals along that line, or else their inertia or their condition of having been born tired is so ingrained that it is impossible for them to make progress. We have not, however, said very much yet about the possibilities of that work in porcelain, and I continue to look forward to the time when more men will be doing porcelain work in their own laboratories rather than accepting the very unsatisfactory shapes and colors that are provided for us by the supply houses.

Another point I had intended to bring up is one Dr. Whiteman spoke of, *viz.*, now that we have covered pretty thoroughly

¹ See Dr. Spalding's paper at p. 123.

² See Dr. Whiteman's paper at p. 130.

the question of the restoration of contact points, there is something to be said about the protection of the gingival margins and the pericemental tissues by the developing of the idea which he has emphasized and which you have seen beautifully shown on the screen. It seems to me that this is a point which needs considerable emphasis—a matter to which nearly all of us have failed to give sufficient attention. I am sure those of you who have noticed carefully the illustrations that have been shown tonight need no further reminder concerning the importance of this point, and I am hopeful this evening will bear fruit in the development of a different type of inlay and crown at the hands of many of us. We will not be satisfied to have our laboratory assistants polish all the shape out of the buccal side of our crowns, or of our large restorations, and surely we are not going to do it ourselves.

There are but few points in the papers to which I would desire to make direct reference. The lines followed by both speakers are so similar to my own that I will leave the question of difference to those who favor the direct method, because I would only emphasize those points.

I want to refer in particular, though, to the influence of the oxyphosphates in deep cavities. We find that old subject cropping up once in a while, and I wish to repeat what I have often said. When I hear reports of oxyphosphate doing injury to the pulp in deep cavities, I want to know what the user's habit is with regard to clearing out decay from the bottom of the cavities, and I have a strong suspicion that he is one of those men who do not clean out cavities thoroughly.

As to the effect on the gum, Dr. Spalding is quite correct, provided care and skill are used in porcelain work. Unfortunately, the same type of man who will not use skill to produce anatomical form in gold restoration, will not do so in porcelain either, but will leave sharp margins and bad joints at the cervix, and will, therefore, destroy the possibilities of this valuable material by the inefficiency of his technic.

Dr. Whiteman's plea for more thorough attention with regard to proximal contacts—a more careful study of them and a more careful consideration of the form of the palatal and lingual sur-

faces in large restorations, is timely and should have our attention.

In coming to another subject which I wanted to speak about, I cannot refrain from calling attention to the fact that before we had cast gold inlays Dr. Spalding had reached the status of a recognized inlay worker—that back in the days he refers to, when he presented the porcelain jacket crown to this Society, if any of us had been called upon to name the ten best porcelain workers in this country, possibly all would have put Dr. Spalding's name on the list. I speak of this because at that time he was constructing inlays almost entirely by the direct method.

The statement was made to me not very long ago by a man who was giving a course in inlay work in one of the study clubs in this city that he had known many instances of men deserting the indirect method for the direct, but he had never known of an instance of a well-equipped man deserting the direct method for the indirect; and I immediately called to his attention the position of our friend Spalding—the fact that he was recognized as a very excellent worker in inlays before he tried the indirect method, and that he had changed his view in the matter. Possibly I take a little pride in that, because I believe I had something to do with this change, and I feel that his results have had an important influence on the inlay workers of Detroit.

I have a suspicion that there are but few inlay workers who take the same position I do concerning one feature of the cast gold inlay, namely, the margin, or, more specifically, the overlap of the gold at the margin. After considerable thought, study and observation of my own work, as well as the work that I see from the hands of other men, I have recently arrived at an understanding in my own mind as to one of the reasons why I favor the indirect system rather than the direct. Before I speak of it in detail I want to make it clear to all of you that I am speaking of inlays made of an alloyed gold, and not of twenty-four carat gold, because the overlap to which I wish to refer will not, in my estimation, give satisfactory results with anything as soft as cast 24-carat gold. I am speaking of an alloy of 97½ pure gold and 2½ platinum. The point I refer to, in which I think I differ from most of you, is this: that on all proximal, buccal or

lingual surfaces I prefer to have a small overlap of the gold beyond the margin of the cavity. I do not desire to finish my inlays flush to the cavity margin, as is our ideal with the packed gold foil filling. I use the bevel which is familiar to all of you at occlusal margins, where it serves the same purpose as the overlap, in addition to a lesser bevel, on the proximal surface.

For all margins, except the occlusal, I want a small overlap—a matter of 1-100 to 1-64 of an inch possibly of a knife-edge shape, thin at the margin, thickening fairly rapidly and running into the contour of the filling. The object of that is that I may easily and surely perfect the joint of the inlay after it is set. Right here I want to call your attention to my conception of a good gold inlay. It is one in which the gold is not in contact with the deep portions of the cavity. I do not want that contact which Dr. Spalding has referred to as dangerous. I want a definite layer of cement, except at the margin of the inlay. I prefer to consider it as a cement filling covered with a perfect gold stopper.

In finishing these overlapping margins a smooth instrument of the burnisher type (preferably of tantalum) should be used to spin the margin snugly to the enamel surface just outside of the cavity margin. In that way I succeed in getting a closer fit of the margin of the inlay than I am able to get any other way. With an accurate amalgam model of the cavity, and the surface of the tooth immediately adjacent to the cavity margin, I can have the inlay, with its overlap, so made, that finishing it with the necessary perfection of marginal fit is easy, both for me and my patient.

I am aware of the technic by which a well-fitting pure gold inlay may be given a good joint, flush with the cavity margin, but I do not like the results attained with cast 24-carat gold, and an alloyed gold is not so successfully managed by that technic. One reason for my selection of a platinized gold is a preference for its color in the mouth. The alloy above suggested, in addition to being sufficiently ductile to permit of the described marginal manipulation, is hard enough so that usage does not so readily dent and roughen it on occlusal surfaces of inlays, and it is still not so hard as to endanger the tooth as is the case with alloys containing 4 per cent or more of platinum.

In watching the results of my Nyman two-piece inlays, which preceded the cast gold inlays, and in which I used a platinized gold outer matrix and endeavored to develop this same slight overlap at the cavity margin, I find the joints remaining perfect just in proportion to the degree of success attained in supplying that overlap and in accurately adapting it to the enamel surface. Where there was such an overlap accurately adapted and finished, the margins remain perfect. So thin an overlap of material as soft as cast 24-carat gold cannot be relied upon to stay in place, and I do not consider it feasible properly to form this overlap by the direct system.

Dr. W. D. Tracy—We have listened to two very interesting and meaty papers this evening, and I confess I do not consider myself competent to discuss them.

One thing that impressed me was Dr. Spalding's statement that he was giving us not scientific laboratory findings, but the results of his clinical observations for a period of seventeen years. It seems to me that while we cannot have laboratory findings on all these problems which loom so large in our minds, we can have the findings of careful clinical observers, and they must have considerable weight with us. When a man like Dr. Spalding, who has been using the porcelain jacket crown for so long, comes before us and tells us about his experience with it, we must listen to the results of his experience.

He speaks of the destruction of pulps in vital teeth by crowning and in large restorations. It is a mooted question whether the covering of a tooth with a shell crown is going to be detrimental to the pulp of that tooth. It has been a long-standing question between Dr. Van Woert, whose opinion we all value so highly, and many of the rest of us. Dr. Van Woert has said that if a tooth is covered by anything, that the pulp will undergo some pathological change. We cannot prove it by the roentgenograms Dr. Spalding has shown us, for we cannot put these teeth on the microscope and see what has happened in the pulp tissue. We see a comparatively normal appearance, and do not see areas of infection where the pulps have remained vital. It is true that areas of infection may occur under the porcelain jacket crown, but that is undoubtedly due to a special

condition which has brought about the death of the pulp.

As to the question of the preservation of the pulp, it is almost needless for me to state my position. Today, when we know so much about the unpleasant sequelae of pulpless teeth and their infection, we all feel convinced that the best teeth are the vital teeth. We used to feel it was no detriment to the dental organ to take out the pulp, but we know differently now. If there are practical means of retaining the vitality of the dental pulp we must equip ourselves to use those means, and the man who does not do so will fall behind in the professional procession. Regarding anatomical restoration and occlusion, we are, of course, much interested. Dr. Spalding, in his numerical placement, put durability as No. 5. I am very apt to have durability come second or third and esthetics last. Dealing with the front of the mouth, of course we must consider esthetics as paramount; but in the posterior region, we must consider durability. My patients say sometimes that they despise gold. I reply: "I do, too; but I have weighed the matter, and even though gold is not esthetic, it is practical and durable, and we must consider appearances as secondary to the practical side in the molar and premolar region."

The influence of the cements has been touched upon. I feel that the bugaboo of dead pulps that was prophesied when we began to make large inlays has never materialized. We did not remove, perhaps, as much disorganized and carious dentin when we knew that every half millimeter we took out meant another half hour of back-breaking work in packing gold foil. We do know in constructing inlays, however, that it is just as easy to make a large inlay as a small one, and we have been perhaps more careful in getting out carious dentin in consequence. And when the inlays are set in carefully cleaned and sterilized cavities, we do not observe the large number of dead pulps that was prophesied.

I want to speak of the silicate cements. The deplorable thing in this connection is the abuse of the silicates. They will not stand abuse any better than other materials. Men have put them where they never should have thought of putting them.

Dr. Spalding speaks of amalgam. He says what is easy to

do is rarely done well. As a general rule, that may be true; but because amalgam is an easy working material that is no reason why we should condemn it. It has been sloppily used, and misused, but it is my contention that it is a very valuable tooth saver, and when used with due regard for anatomical restoration it taxes the skill of any operator. An amalgam filling is a very careful and painstaking piece of work, if properly done, and is valuable in preserving teeth.

The virtues of porcelain are well known to all of us. It is adaptable for many purposes. I know we cannot do with gold what we can safely do with porcelain, because there would be too great thermal changes. Porcelain is undoubted in its kindliness towards the gum tissue, and probably for the reasons stated, that it has a smooth surface and does not offer an abiding place for bacteria. It is a self-cleansing material.

Dr. Ottolengui spoke to me of a case in which the patient had chronic gingivitis, not due to deposits under the gum, but where the gums were naturally irritable. He put three porcelain jacket crowns on, and he noticed to his great delight a marked improvement and cure of the gingivitis. Undoubtedly those porcelain crowns had caused that improvement, coupled possibly with the removal of the microscopic roughness on the natural enamel previously lying under the gum.

The difficulties of the technic I believe have been a bar to the more general adaptation and use of porcelain. However, we must not let that stop us. Suppose it is difficult. We must perfect ourselves in the technic and teach those who are working for us. I taught one man in my laboratory the rudiments, and he can now do with porcelain many things that I cannot do myself. I know that is true also of Dr. Gillett—with all due regard to his ability. The laboratory assistant, living with the work all the time, cultivates a deftness that we ourselves cannot attain.

I have made many mesio-occlusal restorations in molars with porcelain, but I have never been satisfied with them. It may be because they were "gobs" of porcelain, just as I put in "gobs" of gold in the beginning of my cast gold inlay work; but those cannot be accepted as efficient restorations.

I had heard that Dr. Spalding would show us some pictures

of beautiful restorations, where a large part of the tooth had been involved, but where he did not feel it necessary to use a jacket crown. You do that, do you not, Dr. Spalding?

Dr. Spalding—If the restoration is very large I would rather jacket a whole tooth. We do it if conditions are very favorable; but I would rather use a jacket crown.

Dr. Tracy—Now we come to the question of anesthesia for control of sensitive dentin. We are all enthusiastic about that, and everybody must learn how to do work with the minimum of pain. Shall we use desensitizing paste? Good; but is it applicable everywhere, and can we depend on it? No. Shall we use the high-pressure syringe, novocain infiltration anesthesia, intraosseously—or what shall it be? We must try. When we were speaking of the Meyers syringe, one man sitting near me said: "I have one you can buy." I did not master the technic, and perhaps did not have the tenacity to stick to it. I felt it was rather a delicate thing to do. I had great success in getting the anesthesia, and then great mortification in having one or two dead pulps; so that scared me.

We have all been working with novocain, and if we are going to do porcelain jacket crowning we must have recourse to some method of controlling pain. Without anesthesia it is a very distressing operation. My best success has been with infiltration and conductive anesthesia.

I had the good fortune to come in contact with Dr. Goodman, of Los Angeles, who was attending the National Convention here in October. It happened before we got through with our acquaintance that he came to my office, treating several teeth and doing some beautiful porcelain jacket crowns for me. He said he was using intraosseous injections. I remembered the time when Dr. Ottesen, of Copenhagen, was here; but when I saw Dr. Goodman make these beautiful little intraosseous injections I was completely won over. One can get the anesthesia quickly and beautifully; it remains until you finish your work; with the proper hub you do not hurt the soft tissues, and the element of pain is not to be considered.

I am convinced that in my hands novocain and the injection methods—one of the three—is working better than the Meyers

syringe ever did. Of course, that does not condemn the Meyers syringe; it is merely cumbersome in my hands.

I want to pay my compliments to Dr. Whiteman. His contribution is a very important one, put in a concise manner, and dealing with the problems so paramount in restorative work. We in New York got a big hoist from our fellow-member, Dr. J. Lowe Young, who some years ago had to jack us up on the point of our anatomical restorations. All the things that apply to the gold restorations, of course, apply to the porcelain. The question of the gum septum and the transverse septum of the bony process must of course be considered, and many of us will be set thinking and pondering; and the suggestions we have heard this evening will help us over many hard places.

I would like to take up by headings Dr. Whiteman's entire paper, but that would take too much time, and I will merely give him my thanks, knowing that all the other members gladly join me.

President Ash—I am sure we would all be pleased to have Dr. Ottolengui continue the discussion of these papers.

Dr. Ottolengui—I would not accept the President's suggestion except that I think I have something to say that will please Dr. Spalding. I think I have the evidence he tried to bring here. I should like to ask Dr. Spalding first, if Dr. Land made porcelain jackets before he did.

Dr. Spalding—Dr. Land used to make a platinum box for a number of years. In February, 1903, he met me on the street and pulled out of his pocket a little root with a porcelain jacket finished with a beautiful edge at the bottom, and showed it to me. I said to him: "Dr. Land, do you think that is practical? Has it strength?" He said: "Go home and try it." I did try it, and it gave me my first ideas.

Dr. Ottolengui—I only asked that to fix a date. I had in my care about two years ago a lady for whom Dr. Land capped the four front teeth above by that box method. Four or five years afterwards—after the all-porcelain technic was developed—they were removed and replaced by all-porcelain jackets. At the time I saw her she had over twenty jacket crowns in her mouth, including molars. She was suffering from some form of neuritis,

and of course the physicians knew it was her teeth. I very carefully radiographed those teeth—not *en bloc*, but tooth by tooth—and I made a rather peculiar discovery: that the radiographs showed no radiolucent area over any tooth that had been capped alive, but there were three or four teeth in her mouth, molars, as I remember them, which had been pulpless when capped, and they were all diseased. In other words, 100 per cent of the teeth that had been capped alive, fourteen, twelve or ten years ago, apparently were still alive; 100 per cent that had been capped dead were diseased, and 100 per cent of those that had been capped dead were improperly root-filled.

Dr. Tracy's point is a good one. He says you cannot tell whether those pulps are pathological or not. Dr. Broomell has written on that subject, so I need not dilate on it. Let me formulate a truth as an epigram: "*The only absolutely normal pulps are in absolutely normal teeth.*" Just in proportion as a tooth has been invaded by caries is the pulp in that tooth pathological. I look upon the sort of secondary dentin that is built ahead of advancing caries as pathological. It is not like true dentin that is formed in a pulp chamber, where there has been no invasion of caries. The extent of pathology would be defined by the systemic disturbances that occur later on. Many men are pathologic from head to foot, and still live to eighty or ninety years. Many pulps are diseased and yet alive; but if we must abandon any technic in dentistry because the pulp may become pathologic, we must stop filling teeth.

There was a case sent to me by Dr. Berger to-day for an opinion. This lady has an arthritis, and in her knee you can feel the deposits. A very good—radiographer, I would say, but as he is a medical man I will say Roentgenologist—took the pictures of that case. There are a number of teeth in that mouth with imperfect root fillings, but only one in which there is a positive disclosure of a radiolucent area. There are six or seven teeth which are alive, but with large fillings in them, and all of them have very distinct pulp stones. We have to determine just exactly what amount of pathology will cause us to abandon any particular technic.

Having said that much, I want to say this one thing to Dr.

Spalding: You cannot compare a tooth in which you have just ground down the crown with a decayed tooth prepared for a large gold inlay. By grinding you bring about a condition in that pulp which that pulp resents, and which it has not time to draw away from; but the large gold inlay is put into a tooth wherein the pulp has grown gradually accustomed to that condition and in which it has receded. We do know that the pathological pulp seems to be tolerated; it may remain alive, although diseased for a number of years.

Dr. Spalding (in closing)—Dr. Gillett suggests that the irritation attributed to cement may often be because the cavity was not sufficiently cleaned out. I would add also that probably the cement was not thoroughly mixed and had much free phosphoric acid.

I want to give Dr. Gillett credit for starting me on the indirect method road. It was in 1910 that he showed me some completed work done by the indirect method, which was so far superior to what I was doing by the direct method that I was inspired to try the indirect way, and I have been following it ever since. As regards dropping the indirect method and going back to the direct, I have never known any one to do so. I have, however, heard of many instances of men who have learned a definite procedure for the indirect method who have entirely deserted the direct method.

Some have endeavored to use the indirect method and have succeeded in getting good impressions, but poor amalgam dies. The reason for failure in getting a sharp, hard die was that the amalgam was not soft enough when the packing began. The first amalgam put into the impression should be very soft (sloppy) and then hard dry pieces should be used, and the mass actually hammered at the latter end of the packing process to draw out the excess mercury.

I like Dr. Gillett's idea of a gold inlay being "a cement filling with a gold stopper." If we keep that idea in mind we protect the pulp. Of course, we must not forget resistance and retention form for the gold.

Dr. Tracy doubts the desirability of porcelain in molars. I have referred especially to the whole porcelain crown on molar

teeth rather than porcelain inlays in them. It is not a difficult matter to make a porcelain crown for a molar if the indirect method is used. I do use porcelain inlays in molars, but care is exercised in the cavity preparation so that the joint does not come where there is direct contact with the opposing tooth.

I do not condemn amalgam, rather I think a great deal of it. Filling for filling, amalgam has not caused the death of as many pulps as has the cast gold inlay. It is much abused because it can be so easily inserted into a cavity.

An excellent restoration can be made with amalgam, but to do so requires effort and care in cavity preparation, in mixing the amalgam, in its packing, contouring and carving.

A porcelain crown with smooth surface (good glaze) and accurately fitting joint is almost a "sure cure" for an inflamed gum margin. The case shown in Fig. 13 had a decided case of gingivitis before crowning, but in a short time after the crowns were set the inflammation had disappeared. The roughened surfaces held the mucoid deposits, which glazed porcelain did not.

I want to say to Dr. Tracy that it is possible to apply high pressure anesthesia without feeling the tooth is being shot with a high power rifle.

One does not drive a high power motor car through a crowded street with the accelerator pushed clear down.

Time is a large factor, rather than too much pressure, if one does not wish to injure a pulp.

Dr. Whiteman (in closing)—I appreciate very much the manner in which my effort has been received. The gentlemen who discussed the papers apparently agreed with me so fully that I have very little to say.

I agree with Dr. Gillett on the use of the overlap. I like to have my wax patterns with a slight overlap on all margins, giving me enough gold thoroughly to burnish and polish over the margins; especially do I wish the overlap along the buccal, lingual and cervical margins.

I should like to speak about one advantage of the indirect method, and that is the finishing of the cervical margin of an inlay. By the use of an amalgam die one can finish the cervical margin of an inlay so perfectly that no polishing is necessary in

the mouth. This is a great help when the cavity extends some distance underneath the gum tissue, as the inlay can be so finished that it is not necessary to polish after cementing, with the evident danger of injury to the gum tissue.

Dr. Tracy spoke about esthetics and said many patients object to large gold restorations in the posterior part of the mouth. I find that true in many cases, but if I show them the beautiful results secured in restoring the tooth to its original form and the high masticating efficiency which they receive, there is no further objection.

As to the desertion of the indirect method for the direct, I do not know of a case where a man who has thoroughly mastered the indirect technic has returned to the direct method. I believe any man who has deserted the indirect method for the direct has not mastered the indirect technic. Possibly he has chosen the most difficult cavities to experiment with, has had failures, and therefore condemned the method.

A great many cases of flat fillings and inlays where food packs can be corrected without removing the fillings, provided there is a broad enough and sufficiently tight contact. In such cases, by judicious grinding and shaping the fillings, the tendency of food to pack can be corrected. I recall a case recently in my own practice where large proximal alloy fillings had been placed several times to prevent packing, without results. Ten minutes spent with stones and disks corrected the trouble and no more packing was noticed.

I would like at this time to thank the executive committee for the honor extended me in having me appear before this society. I trust I have at least partly covered the subject as they wished it to be presented.

Adjournment.

F. C. KEMPLE, D.D.S.,
Editor, First District Dental Society.

**FIRST DISTRICT DENTAL SOCIETY OF THE STATE
OF NEW YORK**

March 4th, 1918

A regular meeting of the First District Dental Society of the State of New York was held on Monday evening, March 4th,

1918, at the Academy of Medicine, No. 17 West 43rd Street, New York City.

The President, Dr. Charles F. Ash, occupied the chair, and called the meeting to order.

The paper of the evening was read by Dr. Alden J. Bush, of Columbus, Ohio, and was entitled: "The Restoration of Missing or Lost Teeth."¹

Discussion on Dr. Bush's Paper

Dr. James P. Ruyl—I have listened to Dr. Bush's able paper with a great deal of interest, and I am glad to make a few remarks and to thank him. He has brought his subject before us in a very beautiful way and has shown great depth of thought. I only wish he had gone a little more into detail. He knows his subject so well that he has touched only the high spots, taking it for granted that we can understand what he has left unsaid; but several things he revealed to-night have thrown a light upon the mysteries of a successful and artistic denture, where many of us heretofore have been groping in the dark.

It is undoubtedly true, as he says, that prosthesis requires more skill and thought than any other branch of dentistry, and I have always believed that the successful prosthodontist is the best dentist. Prosthesis has been passed over very lightly, except by a few men who have been handicapped, not only by an indifferent profession, which was inclined to consider the prosthodontist only a laboratory man, but also by the manufacturer, who up to very recent years has given us nothing to work with. Of course, since the new teeth have come in, very much better work is being done, because these new teeth are an incentive and better results inevitably follow, even though the average dentist has a nearly hopeless idea of the correct position of the teeth.

Dr. Bush's idea of the study of facial deformities and of making plates to fit those deformities is an entirely new thought. His idea is, that you must visualize the whole thing in your mind before you begin to work. Many times when I have tried to follow out normal occlusion in what was originally an abnormal

¹ Dr. Bush's paper printed in full at page 134 of this issue of THE JOURNAL.

FIGURE 1

FIGURE 2

FIGURE 3

FIGURE 4

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mouth, I did not get the desired effect until I had worked out abnormal occlusion. It was my intuition that guided me. I had no rule. This brings a case to my mind of an edentulous mouth that must have had a distinct malocclusion before the teeth were removed. In looking at the face no particular deformity showed itself around the lips, but when I attempted to set up teeth in normal occlusion I had such a protrusion of the lower lips that that particular denture was not in harmony with the face and lips until the lower teeth were set distally of the uppers about one-quarter of an inch, thereby making a malocclusion and yet a beautiful and natural effect. I do believe, however, that in a malocclusion, where the lower teeth have moved forward and an upper plate has been worn for many years, it is not always necessary to make a malocclusion in the dentures, because of that particular facial deformity; and I also believe that by the removal of those lower teeth and the cutting away of sufficient process one can drop back the lower lip and make a normal restoration of the face and a normal occlusion of the teeth.

In Dr. Bush's remarks on partial cases, where he speaks of following out abnormal occlusion, I am sorry he did not continue and impress upon us the necessity of making the artificial teeth characteristic of the natural ones, and not just filling up space with any teeth at hand.

Description of Slides

This picture represents what Dr. Bush calls his Class II case.

On this slide we have a man who has been wearing a full upper denture about twelve years. In the lower jaw he had a malocclusion, with only a few remaining teeth. They became loosened on account of the constant hammering against the upper plate and a bad case of pyorrhea resulted. The man who made the set for him thought he had to follow out the malocclusion, and he allowed them to strike inside of the lower.

You see, he is wearing the teeth striking on the inside of the remaining lower teeth. From the appearance we would think that this man has a protruding lower jaw, but he has not. According to all measurements, he has a perfectly normal jaw, and after the

removal of the teeth and the cutting away of the process we see the man with full upper and lower plates in place—after six weeks—with a result that one would think almost impossible.

As the Doctor says, it is best to give a person a full upper and lower denture, according to the condition he had beforehand, so that he may have the maximum amount of efficiency immediately. Of course, the condyle path has been established, and when a plate has been fitted and a normal inclined plane established in the glenoid fossa, this man will probably have a little more difficulty at first in manipulating the teeth, although I find nature takes care of those cases very kindly, and the condyle eventually establishes a new path.

This man had been wearing those plates for a couple of years, and even if he does not get the maximum amount of efficiency that he gets with a malocclusion, I would rather give this minimum amount of efficiency, with the increased cosmetic effect, because nature will supply efficiency later on.

Here is the same man—front and side view—and the harmony followed out with the face. The shape of the tooth is identical with the shape of the face and of the arch. I have found that idea works out absolutely, with almost every edentulous case.

Dr. J. H. Tuttle—The point of primary importance in the treatment of these cases should be the attempt to restore an occlusion that will not subject the pier or abutment teeth to an unnatural stress. It should be borne in mind, while working out the plan of restoration, that these patients are usually past middle age, that the mandibular movements are fixed more or less by the limitation of the condyle path established by the original conditions, or malocclusion, and that too great a departure from the accustomed movements of the mandible, such as opening the bite too far, or causing the artificial substitutes to create an entirely unnatural occlusion, will invariably result in discomfort to the patient and the wrecking of the pier-teeth, by an attempt on his part to return to the habitual mandibular movements before restorations were made. It should be considered essential to restore the maximum amount of masticating surface with as near an approach to normal occlusion as the conditions warrant.

FIGURE 9

FIGURE 10

The only conservative method of accomplishing such a result is by acquiring a complete grasp of the situation as a whole, and this can usually be obtained by a careful study of the conditions in the mouth itself, supplemented by carefully prepared study models and a complete set of radiographs, from which data it is possible to plan the necessary restoration to accomplish one's purpose.

We are often called upon in the study of these cases to use a great deal of good judgment as to the best method of accomplishing the desired result. One must decide which teeth are desirable as abutments, which should be extracted and which devitalized. It is also often a perplexing problem to choose between fixed and removable restorations, as I think there is a place for both when good judgment is used; although were it made compulsory for me to make a choice and adopt one method or the other for the balance of my practice, I should pick removable appliances as more nearly approaching the ideal for the greatest number of cases.

When selecting the teeth for abutments, the main points of consideration should be their condition as to health and the location in the arch. For illustration, we will suppose a hypothetical case of a maxilla with four remaining normal teeth in health, a third molar, cuspid and lateral on one side of the arch, and a lateral incisor on the other. Notwithstanding their normal condition, teeth so situated would be valueless as abutments for any type of bridge work, fixed or removable. On the other hand, four teeth remaining, such as a molar on each side and bicuspid or cuspid on each side, might give service as abutments for a removable bridge for a long period, even though their periodontal attachment might not be quite so sound as the first mentioned case.

It seems therefore that it is of the greatest importance to select teeth for abutments that are favorably located and that one may be reasonably sure, from radiographic findings, may be restored to a state of health. All others, including those which will positively interfere with the plan of restoration, should be extracted before beginning the case. I have found though that this point also requires a good deal of consideration, as many times a

tooth which appears almost hopelessly elongated may be devitalized if necessary, and cut off, and a suitable cast base crown made which will correct the condition and bring it into a normal relation with the others in the arch, and with its antagonists. If one cares to apply orthodontic means, it is often possible to move these teeth with an appliance into the arch, bring migrated teeth back into position, or straighten up teeth which have fallen toward each other, such as the bicuspid and lower second or third molars, when the first molar has been lost for a considerable period.

As to the technic of constructing abutments, whether they be crowns or inlays, the main consideration is absolute accuracy of adaptation and intelligent preparation of the abutment teeth. In the case of crowns, I would condemn on general principles the complete shell crown, unless it is made with the same preparation as for a porcelain jacket with a shoulder slightly below the gingiva, to make a flush joint. Another point of the greatest importance in the construction of all crowns, is the anatomical reproduction of the tooth form, and the restoration of the enamel ridge at the gingiva for the purpose of deflection of food from the gums during mastication. This should be very carefully brought out in the wax carving, so as to give the restoration exactly the correct form without at the same time overdoing it. Good contact points, and the restoration of the marginal enamel ridge above the point of contact must also not be neglected.

In connection with the anatomical reproduction of the tooth forms, I am heartily in accord with the essayist's departure from previous teaching, as applied to cusp reproduction. If the anatomical cusp is too closely adhered to, making an interlocking of the antagonizing teeth without consideration of the habitual mandibular movements, it will result in a conflict of forces, to the detriment of the pier teeth.

Where inlays are used for abutments, the cavity preparation should be considered from every angle of stress and occlusion, flat gingival seat with right angle axial wall and flat occlusal seat with amply sufficient depth for box-like retention. As there is usually considerable danger of fracturing the buccal or lingual cusp, it is wise to truncate these walls and carry the gold over for protection. These inlays should invariably be cast in a harder

metal than 24 K. gold. I prefer five per cent alloy of platinum or coin gold.

Regarding the use of removable bridges, there are so many different types, all of which have more or less merit when skillfully carried out, and every minute detail attended to. The principal defect, common to all, is the exacting requirement of numberless details, without attention to each of which, the final result is imperfect and hopeless; and all of this requires the expenditure of many hours, often days and weeks of time, on a single case, and places this work beyond the average patient, on account of the fee.

I have been helped in the past few years by Dr. Knox, of Brooklyn, in the perfection of the details of a compact, neat, partial denture, with cast clasps, which takes the place of many more complicated appliances of removable bridgework; and I am not so sure but what they will give equally as satisfactory service at much less cost of tooth structure, pulps and money to the patient. This method, of course, should not be considered under a discussion of removable bridgework, although it is hard to differentiate between a removable bridge and a partial plate, if the saddles be small enough. A patient of mine, for whom I had constructed a removable bridge, told me that a Canadian dentist informed her that the New York dentists were now making partial plates, calling them removable bridgework, and charging \$1,000 for them.

The essentials of these cast clasp restorations are accurate individual impressions of the teeth to be clasped, which are poured in investment material (I have found R & R to answer the purpose best), the clasp waxed directly on the investment model, just taking in the largest diameter of the tooth, invested and cast in Ney Oro E. cast clasp metal: the clasps finished, polished and replaced on their respective teeth in the mouth, and an accurate plaster impression taken after Dr. Angle's method, by removing the tray and re-assembling the parts and placing the clasps in position in the impression, and pouring in Weinstein's artificial stone.

By careful observation and consideration of the position and angles of teeth to be clasped, it is possible to so make clasps that from the buccal aspect will not show, and it is also possible to take

advantage of peculiarities in the contour of the teeth to get the maximum amount of advantageous clasping surface. I have tried a number of different clasp metals for casting, and find this Ney Oro metal to be the best so far that I have used, it having more resiliency than any other that I have tried, giving the finished piece a slight mobility, which is advantageous, and allowing waxing of thinner clasps than is possible with other metals.

The piece can be finished with vulcanite or gold saddles, and makes a restoration which is satisfactory and inexpensive to the patient in comparison with removable bridgework, and gives the maximum of pulp conservation, as often it is unnecessary to do anything at all to the pier teeth except thorough prophylaxis, and polishing of the enamel, before taking the individual impressions. If the teeth are found to have imperfect or rough fillings, it is, of course, necessary to remove these and replace with well-adapted and polished fillings or inlays before proceeding. I frequently make these clasps around porcelain jacket crowns and find them very satisfactory.

I wish to thank the essayist for his very instructive paper.

Dr. Norman Essig, of Philadelphia—I have been much interested in the remarks made by those who discussed the paper this evening. They brought to my mind thoughts that have often lingered there to the effect that, figuratively speaking, dentists of the present day are very apt to crave predigested food. In other words, they have had so much prepared and given to them in the past that they have not thought very much for themselves.

This meeting, however, shows that such is not always the case, for there has been a strong tendency to get away from what I designate as predigested food.

I am rather inclined to think that for a long time we have been looking through the wrong end of the telescope at the question of occlusion and malocclusion. It might be well, in speaking of the function of occlusion, to go back a step or so to the eruption of teeth. Why do they erupt, and why do they come through with any degree of precision, or why do we have any occlusion at all; why is there malocclusion—again, why has not every one a perfectly occluded set of teeth?

One of the explanations for malocclusion that presents itself to me is that unscientific marriages have produced a condition of affairs, through the laws of inheritance, which perhaps have had a large bearing on the question of occlusion. That teeth occlude at all is probably due to the fact that there is a wonderful harmony of relation between the cusps, the cusp angles and the sizes of the bicuspid and molars themselves. The incisor teeth, I am inclined to think, as far as my own experience is concerned, play less of a part, in a way, than the bicuspid and molars; but anyone who has carefully studied the form and the angles, the protuberances and the indentations, peculiar to cusp formation in teeth, cannot but be impressed with the fact that they were intended to nose their way into place, in other words, to find their own alignment, only being restricted by the occlusal plane produced by the full complement of bicuspid and molars. The question of the occlusal plane is the point from which, I am sure, many of us have been regarding the question of articulation and this is the wrong aspect.

We have been trying to establish an occlusal plane by evolving it from the condyle path which differs in every case, whereas, if we establish the occlusal plane first, the condyle path can take care of itself and becomes of minor importance. In other words, if we take our bite first, and build upon it a material that can be worn easily by attrition, we will find that if the patient is instructed to go through with the masticatory movements, not only are the occlusal planes definitely established, but also the over bite centre line, and the canine protuberances. If we build upon the bite plaster and marble dust, and allow the patient to go through with all the movements of mastication, these most important details will evolve themselves with great accuracy.

One of the reasons we have not been able to restore the relations of the maxilla and mandible, or correct malocclusion by use of artificial teeth, is because we never have had artificial teeth that could restore them. We have had presupposed proportions—proportions which are as far as our eyes can tell, perfectly adequate; yet if we were to compare them with the natural organs of mastication, we would find they were a very poor imitation, and far from anatomically correct. It is perfectly possible to take twenty-eight natural teeth, set them on an articulator, and get a much

better articulation than their original owner ever had in the natural articulation or alignment.

Only recently I had a case where I made absolute reproductions of the bicuspid and molars of a young man of about thirty years, and very shortly after, I used these teeth in the mouth of a man of fifty-five. The amount of comfort and satisfaction resulting from this articulation and occlusion was perfectly marvelous. Every one of these teeth I found would fit in the opposite tooth in its normal alignment. I believe all natural teeth are capable of perfect alignment, but through malformation of the bony integument they have many times not been allowed to come into their proper place in the arch.

I am furthermore convinced that there is only one articulator that is capable of making all the anatomical movements, and that is the mandible and the alignment which every patient brings with him when he asks for dental service; the only use we have for the mechanical articulator is to maintain the alignment and articulation as we have been able to get it on nature's own articulating device. In that way we get a result probably more dependable than any other method we have been able to find up to date. The normal occlusion, I believe, can be better restored in ninety-nine cases out of a hundred if the teeth are an absolutely exact anatomical reproduction.

I do not see how we have managed as well as we have up to the present time, nor do I see why we have not appreciated certain phases of this subject, when as a matter of fact it has been crying for recognition for years.

Dr. Bush (in closing)—I have but little to say in the closing of the discussion. I wish to thank those who took part in the discussion. I was interested in finding out how my paper was interpreted, or at least how the intentions of my paper were interpreted. I intended to speak only of the application of the principles of occlusion and to say nothing about methods whatever. The cases which Dr. Ruyl showed on the screen, I was very much interested in. I recognized in one a perfect Class I case in which the mandible and maxilla are in normal distal relation. In the other, I recognized a Class III. There is a subdivision in Class III, and without seeing the patient, I would say

possibly it was a sub-division, being mesial on one side only; it was not a very extreme case. Class III cases are very progressive, and the amount of deviation from the normal is in direct proportion to the time that the causes which perverted it have existed. The case shown on the screen was not a very aggravated one.

According to the Angle classification of malocclusion, Class II is where the arch is distal to normal, and Class III is where the lower arch is mesial to normal. Class II has two divisions, 1 and 2. Division 1 is characterized by protruding upper incisors, and is primarily associated with mouth breathing.

Division 2 is further characterized by retruding upper incisors, and is always associated with normal breathing.

There is nothing in my paper, except a desire for you to look into the principles of occlusion as applied to the restoration of missing teeth by means of bridge work, partial and full dentures.

Adjournment.

F. C. KEMPLE, D.D.S.,
Editor, First District Dental Society.

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EDITORIAL DEPARTMENT

WAR AND SCIENCE

With the tide of war rolling on, sweeping the face of the earth in its swift contagion—with the labors of the civilized centuries passing before our eyes—men think of essential things, and forget the intricate and petty affairs of the peaceful years.

Our supreme business today is to win the war—"to make the world a decent place to live in." This may seem too obvious to put into words, but that which has become our daily creed cannot too often be spoken. All knowledge, skill, ingenuity and effort must be devoted wholly to the work in hand. One impor-

* 1st Lieut., D. O. R. C., U. S. A.; on active duty.

† 1st Lieut., D. C., N. G., U. S. A.; on active duty.

tant department of our military machine is the medical, and of that the dental specialty has acquired conspicuous prominence in the light of four years of experience in trench warfare. We have been informed recently that in the French Army the number of men incapacitated more or less because of dental disease has averaged thirty thousand: a constant handicap of no small consequence. Aside from the care of injuries received in battle, the maintenance of dental and oral health in our armies has become a work of great importance.

This newly recognized need of the fighting man is being met by our Army Dental Corps; and a vast amount of routine dental work is being dispatched by the 15,000 civilian dentists who comprise the Preparedness League—an organization of volunteers who give their time and skill towards making the recruit dentally fit. When it is considered that the average enlisted man presents dental defects requiring a minimum of several hours for the simplest treatment, and when his case is multiplied by a million and more,—it is clearly evident that the strictly necessary dental service for our army alone is a task of great magnitude.

In view of this fact, and the very limited time available for such work while our men are being rushed overseas, only radical, sure and speedy treatment can be attempted. That is, putrescent teeth must be removed without question and at once; and in our opinion the same is the only safe course with teeth the pulps of which are so deeply infected that the ordinary filling procedure will not insure comfort and health. In other words, root canal treatment cannot wisely be attempted at this time. The loss of valuable members to insure immunity from infection under stress of trench living conditions, is part of the fighting man's sacrifice. He must be, first of all, an efficient soldier,—not for his own sake but that of his country; and he cannot be permitted to be disabled by toothache when the critical moment comes, even though personally willing to suffer temporary pain to save a certain tooth. The soldier must realize that

he is not his own man: he has given himself without reserve, and must abide the vicissitudes of war.

But while our boys are saving the day in Europe, and while the exigencies of the hour demand emergency measures, the institutions of peace and the growth of science must be cherished and made certain. The work of our investigators must go on, undisturbed as little as may be; our great conventions must be held, and the interchange of ideas encouraged by those who remain in civilian life. That is the duty the professional man owes his fellow man—now more clearly than in normal times. The meeting of the National Dental Association in Chicago early in August presents an opportunity to all who can be there to help in keeping alight the torch of knowledge, that it may burn the more brightly in the years to come. The unveiling of the memorial to our great leader in dental scientific research, Greene Vardiman Black, which we picture in this issue, is most fitting and timely. The serene countenance of Doctor Black in immortal bronze, will cheer thousands who have been inspired by his life and work. It should typify the steadfastness of our faith in the triumph of ultimate good.

OUR SERVICE FLAG

There are now five stars upon THE JOURNAL'S Service Flag,—nearly one-half of our Editorial Staff having been assigned to active duty as dental officers in the United States Army. Dr. MacDonald will soon have finished his year overseas with the Fighting Engineers—and has earned his place in the proud record of that famous regiment. Drs. Palmer and Carney, after strenuous months at Spartanburg, and Dr. Fletcher, are "Over There." Dr. Davenport, who accepted his commission as First Lieutenant last December, has been called to active duty. THE JOURNAL loses the important work of these faithful friends, but, it may be needless to say, that loss is not to be reckoned in the light of the fine service they are giving their Country. We at home follow our "boys" with solemn pride and affectionate good wishes.

CURRENT DENTAL LITERATURE

COMPILED BY ARTHUR H. MERRITT, D.D.S.

Titles marked with an asterisk (*) are abstracted briefly

Dental Cosmos, *April*, 1918.

15 Apophesin: the New Local Anesthetic. J. S. Shields.

After an experience involving over 700 oral operations it is the Author's belief that apophesin is the ideal local anesthetic. It differs from novocain in that it is a propyl ester of cinnamic acid, instead of an ethylester of benzoic acid. It is less toxic than any known local anesthetic, is boilable and freely soluble in water and is the equal of cocain in its anesthetic power. It does not deteriorate when combined with adrenalin, is non-irritating and produces anesthesia by infiltration in one minute, and by conduction in 5 to 10 minutes. It may be prepared by dissolving one tablet of apophesin combined with adrenalin for every 2 cc of Ringers solution and boiling the whole to insure sterility. It has no habit forming properties and does not therefore come within the provisions of the Harrison Narcotic Law.

Dental Digest, *May, Sept., Oct., Nov., Dec.*, 1917. *April-May* 1918.

16 Observations of Oral Conditions in Their Relation to Body Function. W. A. Cotton.

The Author undertakes to show that the individual in whom all the physiological functions are normal, is immune to dental caries, and is less liable to pyorrhea and calculary deposits. The secretions of the oral mucosa are the protecting agents in the mouth, inhibiting bacterial growth and food decomposition. The saliva has no such power, its only action in the prevention of dental caries being to wash away adhering particles of food.

Dental Items of Interest, *January*, 1918.

17 Electrolytic Therapeusis Versus Apicoectomy as an Efficient Method for Prevention and Eradication of Apical Infections.

Arthur Zentler.

Report is made of experiments undertaken for the purpose of ascertaining the value of electrolytic medication and apicoectomy in the prevention and eradication of apical infection. The report includes 4 cases, two of which after electrolytic medication and approved root filling, were found when apicoectomies were performed several months later, to yield pure cultures of streptococcus viridans, proving in the Author's opinion that such medication did not eradicate the infection. Four and six months later these same cases were again subjected to bacterial examination and found to be negative. In two other cases, in which root filling followed the removal of vital pulps,

bacterial growth was found to be absent when apicoectomies were formed several months later, notwithstanding the fact that neither had received electrolytic medication. The deductions are that in cases where electrolytic medication failed to eradicate the infection, apicoectomy is effective: that where no infection was present prior to root filling, the apical area does not become infected, in spite of the fact that no electrolytic medication was used, and that in cases of freshly devitalized pulps with no evidence of infection, no electrolytic therapeusis, and incomplete root filling, the amputation of the unfilled portion does prevent apical infection as proved by subsequent bacterial examination.

Dental Items of Interest, *March*, 1918.

- 18. *Constitutional Diseases in Infancy and Dentition. G. Lippman.
- 19. *The Therapeutic Efficiency of Oral Preparations. H. Prinz.
- 20. *Clasped Partial Dentures Versus Bridge Work. H. J. Goslee.

18 Constitutional Diseases in Infancy and Dentition.

Lippman asserts that the cause of dental caries does not rest on congenital lack of resistance, but in injudicious feeding: that the rachitic and exudative diatheses must also be regarded as causative agents in caries and mal-occlusion, and that the influence of syphilis on the teeth is of minor importance. The Author deals at some length with the question of infant feeding, rickets, syphilis and the exudative diathesis.

19 The Therapeutic Efficiency of Oral Preparations.

As a result of many experiments with the various dental preparations on the market, the Author is of the opinion that sterilization of the mouth with any of them, including dentifrices and washes, is impossible. Their use when combined with the mechanical effects of the tooth brush was found to reduce the numbers of oral organisms about 50 per cent. The claims made for the antiseptic strength of certain commercial preparations were found to be wholly unwarranted. The Author recommends a physiological salt solution of body temperature in conjunction with a tooth brush and dentifrice of known composition as the safest and most efficient of all artificial measures for cleansing the mouth and teeth.

20 Clasped Partial Dentures Versus Bridge Work.

A comparison is made of the relative value of fixed bridges, removable bridges and clasped partial dentures. Regarding the first, it is asserted that they are frequently indicated and may be so constructed as to be fairly sanitary and more or less permanent. They should as a rule be limited to the replacement of a few teeth—one to four. Removable bridgework differs from the clasp denture in that the area of the supporting base is reduced and the attachment, instead

of encircling the tooth, engages with some style of structure which is permanently attached to the abutment teeth. This type of bridge requires skill of a high order, both in mechanical construction and in preparation of the teeth and root canals to which it is attached. Because of this and the objectionable sacrifice of sound tooth structure, such work is necessarily so intricate and expensive, that only the very skilled can do it and the very rich afford it. The Author recommends the clasped partial denture because of its cheapness of construction, the absence of necessity for tooth destruction and the relatively little strain upon the supporting natural teeth. The different types of clasp and those best adapted for use, are outlined at considerable length, and the statement made that wherever they may be properly used, well adapted clasps offer the most simple, effective, permanent and sanitary means of fixture for all forms of removable partial dentures, at the same time being the least expensive and injurious.

Dental Review, April, 1918.

21 A Consideration of Some of the Important Infections Affecting the Region of the Mandible. L. Schultz.

It is the Author's opinion that extraction of teeth involved in acute infection, especially impacted third molars, is usually best postponed until the abscess is drained and the swelling reduced. The exposure of the patient to unnecessary danger from trauma, with lowered resistance to invasion, far overshadows any benefit which may be derived from drainage. As a rule extraction should be deferred until the abscess has been drained and the tissues about the tooth are quiescent. Regarding Ludwig's Angina, the statement is made that it is characterized by a sudden onset involving the cellular planes of the floor of the mouth, converting these structures into a hard mass, sometimes attaining to the height of the occlusal planes of the teeth, and being exceedingly painful. It is believed to be caused by a streptococcus. Diagnosis may be made by the sudden onset of the symptoms and by the hard and sensitive nature of the swelling extending from the chin to the angles of the jaw. Treatment consists in early and adequate drainage. The mortality from this disease is as high as 40 per cent.

Dental Summary, April, 1918.

22. *The Treatment and Filling of Root Canals. O. G. Wilson.
23. *Chloro Percha Does not Radiograph. W. C. Davis.

22 The Treatment and Filling of Root Canals.

The advocacy of opening and filling all root canals to their extreme end is, in the opinion of the Author, not only impossible but productive of great harm, inasmuch as any irritation of the apical area may and frequently does, result in permanent injury. The important factor in the treatment of these cases is the achievement and main-

tenance of asepsis. Having prepared the root canal for filling, (and it is asserted that never more than one treatment is necessary, except in cases of active infection), the canal is filled with euca-percha and a gutta percha cone, from which the point has been cut, is forced into position. If some of the euca-percha is carried beyond the apex no harm will result, and should it fail completely to fill inaccessible canal terminals, these unfilled portions will give no trouble as they are rendered immune to germ action. Euca-percha paste may be made by taking ordinary "temporary stopping" dividing it into small portions and dissolving it in eucalyptol to a creamy consistency. It is asserted that teeth devitalized with arsenic are less liable to subsequent infection than are those not so treated; in fact they may be said to be immune, as a result of the germicidal action of this drug. Chronic fistulous abscesses are treated by forcing through the tooth and sinus a solution of equal parts of iodine and creosote. One treatment is usually sufficient to clear up such cases as are not complicated with necrosis.

23 Chloropercha Does Not Radiograph.

It is asserted that chloropercha in a root canal is not impervious to the roentgen ray, that a canal may be filled throughout without there being any evidence of it in the roentgenogram. It is believed that this explains why it is that many root canals which seem to be only partially filled, create no disturbance at their apices: they have in reality been sealed, though the roentgenogram gives no evidence of it. The Author recommends using what he terms "a radiodescent chloropercha" by the addition to it of 8 grams of bismuth subnitrate to each dram of chloroform before the gutta percha is added. Root canals so filled will be clearly outlined in the roentgenogram.

Journal of the American Medical Association,

January 26, 1918.

24. *The Comparative Efficiency of Local Anesthetics. T. Sollmann.

25. Dental Caries. Editorial.

24 The Comparative Efficiency of Local Anesthetics.

The article deals with the Author's investigations of the clinical efficiency of local anesthetics as determined by experimentation. All the local anesthetics of common use were studied. The methods employed were the intracutaneous, application of the anesthetics to the motor fibers of nerve trunks and also to the sensory fibers of nerve trunks. The intracutaneous method gave the closest approximation to absolute anesthetic efficiency, since in this way the solution came into direct contact with nerve fibers. It was found that the alkalization of the solution served no useful purpose: its anesthetic efficiency was not thereby increased as has been asserted. Cocaine, novocaine, tropacocaine and alypin were found to be about equally

efficient in infiltration and injection anesthesia. Epinephrin greatly prolongs their action and should always be added except to tropacocain. In view of the fact that several of the synthetic anesthetics can completely take the place of cocain the Author believes it would be feasible entirely to prohibit its importation except for scientific purposes.













Percent- age		Fig. 1. Efficiency of Anesthetics		Efficiency Ratio
A. Intracutaneous Method (Infil- tration and Injection Anes- thesia)	1/32			1
		Cocain, novocain, tropacocain and alypin hydrochlorids		
	1/16			1/2
		Beta-eucain hydrochlorid		
	1/8			1/4
		Quinin-urea hydrochlorid		
	1/4			1/8
		Apothesin, antipyrin, K ₂ SO ₄		
B. Sensory Fibers of Nerve Trunk	1/4			1
		Cocain, novocain and tropacocain hydrochlorids		
	1/2			1/2
		Alypin hydrochlorid, KCl		
	2			1/8
		Quinin-urea hydrochlorid		
	8			1/32
		Antipyrin		
C. Motor Fibers of Nerve Trunk	1/8			1
		Cocain, novocain and tropacocain hydrochlorids		
	1/6			3/4
		Alypin hydrochlorid		
	1/4			1/2
		KCl		
	1			1/8
		Quinin-urea hydrochlorid and antipyrin		

Fig. 1.—Efficiency of anesthetics in injection anesthetics.

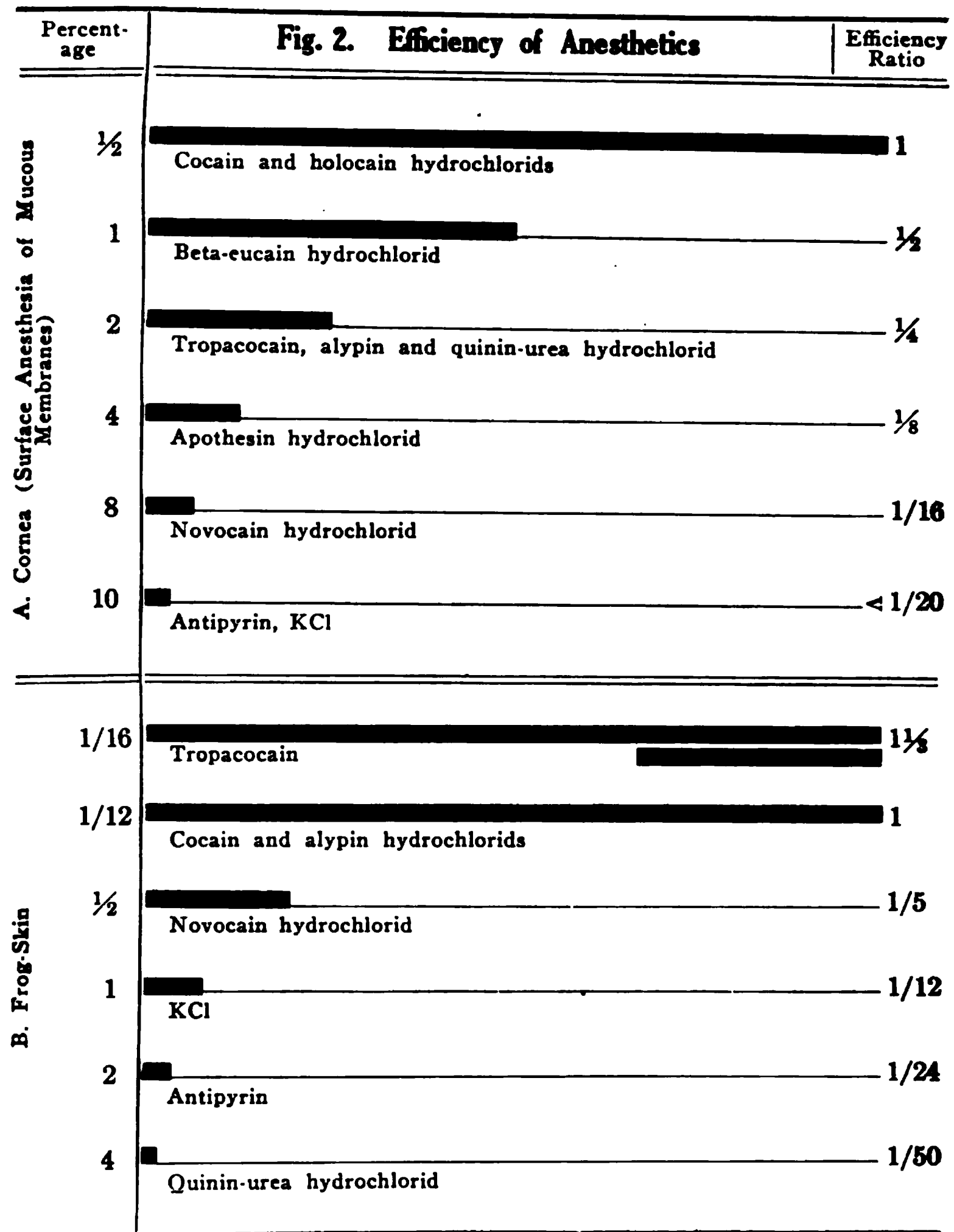


Fig. 2.—Efficiency of anesthetics in surface anesthesia.

NOTES ON DENTAL PRACTICE

COMPILED BY WILLIAM D. TRACY, D.D.S.

Care in Mixing Alloys.—Maximum strength in an alloy is reached only after trituration in a mortar continued as long as four to six minutes. If continued up to ten minutes there is but little change, while if carried on for only three minutes the strength is noticeably less, and it falls off with increasing rapidity as the triturating time is still further shortened. If the amalgam is triturated for only about a minute and a half, subsequent kneading in the hand will, to be sure, bring about a slight increase in strength; but time consumed in kneading is not nearly so effective as the time spent in mortar trituration, and it does not produce such uniform results. Moreover, from a sanitary standpoint the mortar and pestle are greatly to be preferred, because no epithelium, or skin detritus, is thereby worked into the mass.—*Dental Quarterly*.

Influences of Malocclusion.—1. The efficiency of a denture is dependent, not only upon the full complement of teeth in normal occlusion, but also upon each tooth being complete in its form, integral in its constituent parts and secure in its attachments to the supporting structures.

2. With the loss of one unit of a denture the functional efficiency is reduced to a vastly greater extent than that represented by the relative numerical proportion of the teeth in that denture.

3. The teeth, though vitally concerned in the mastication of food, constitute at the same time important adjuncts in the perfection of the functions of respiration and of speech.

4. With every digression from the normal in occlusion affecting the process of mastication, there is also a corresponding deviation from the normal in respiration and speech.

5. As these fundamental facts are fully recognized and the lesson appreciated, the profession may learn to pay greater heed to the warnings in every act, urging on to the best efforts, with punishment in failure and compensation in the glory of success.—MILO HELLMAN, *N. Y. Medical Journal*.

To Work Ames' Black Copper Cement.—This may be worked so as to allow more time before the mix sets if mixed upon a cold-water bottle slab. The fluid cement may often be dropped into place in the tooth, when it almost flashes into a set, so quickly does it harden as it acquires the tooth temperature. Also, in setting crowns copper cement mixed upon the cold slab offers similar advantages, and may we not thus eliminate the disgusting putrefaction of material absorbed in zinc cement under crowns?—J. F. F. WALTZ, *Dental Review*.

The Occlusal Surfaces of the Human Teeth.—If any cusp or series of cusps are so placed that they interfere with the mandibular move-

ments, they will be reduced to a point where they are in harmony or the tooth of which they are a part will be exfoliated, while the mandible swings merrily on in its accustomed arcs.

If you find that certain cusps have been worn down and you are reproducing the antagonist, I would advise that this new member of the arch shall also have cusps that are worn in like manner. Reproduce what you find in the mouth and do not carve deep sulci or prominent cusps when it is not indicated. Likewise, do not make flat restorations when the reverse condition is indicated.—F. W. FRAHM, *American Dentist*.

Gold for Casting.—Never use the remnant of a previous casting for making a new inlay without thoroughly refining the gold. It really pays never to use gold a second time, as gold cannot be refined as well by a dentist as by an expert gold refiner. Gold can be obtained in nugget form, and a fresh nugget used for each casting. The remnants can be returned to the gold dealer, who will give credit for them. The small difference between the buying and the selling price of these gold nuggets is more than covered by the advantage of knowing that your gold is always right for casting. Anyway, never use "office scraps," trying to refine them yourself. If you do, you are not using identical methods and materials all the time, and of course will not get even results. Therefore, always use the same grade or karat of gold.—*Dental Items of Interest*.

Post-Operative Treatment of Apicoectomy Wound.—In major surgery the immediate closure of a wound minus a drain, after an infected bone operation, is, of course, rarely successful; but in the vascular buccal cavity, and when the curretted area is not larger than the size of a pea, we may take advantage of our region and its small size, and suture. Wound areas, however, of larger dimensions should be packed lightly with a 10 per cent iodoform gauze and the dressings changed at least every 48 hours; plus a frequent mouth toilet until the wound, building from the bottom, becomes shallow. To leave the wound unsutured and unpacked may result, as my experience has shown, in failure of osseous repair, obvious both roentgenographically and microscopically.—S. L. SILVERMAN, *Journal of the N. D. A.*

The Use of Silver Nitrate.—There is one very valuable adjunct in the treatment of deciduous teeth to which we must give full credit for its wonderful preventive quality, i.e., silver nitrate. The one great objection to silver nitrate is more than counterbalanced by its efficiency and value in this particular use. It tends to darken the painted area, but it seldom darkens unbroken enamel. Where caries has started in the enamel and only a few rods have fallen out, it will not darken the exposed dentin. Yet, when applied to a cavity where there is considerable advance of caries, it darkens the area. But withal, while there may be some objection to the darkened or stained area, yet, when we consider that its application once, twice, or three times will temporarily abate or

arrest the advance of caries, we must admit that this virtue is greater than the objection. The value of silver nitrate cannot be overestimated. Use a saturated solution, or where a weaker solution is desired, dilute sufficient quantity of the stock saturated solution with phenol to suit the requirements. Often a solution is made up fresh by using the crystals of silver nitrate dissolved in phenol or distilled water. This is used in dental practice to check caries of the deciduous teeth where a filling operation is impracticable. Use it freely in deciduous teeth. In fact, where shallow cavities occur, the tooth surface is painted or rubbed up with nitrate of silver and as a result, caries is so abated that frequently the tooth reaches its natural exfoliation without further consequence. In some shallow cavities where the walls are broken down, the sharp angles are reduced to smooth surfaces with the disk or stone and then an application of silver nitrate will tide over the little one until he has a new tooth ready to take the place of the old.—W. R. HUGHES, *Dental Digest*.

The Importance of Diagnosis.—The American public mind is rapidly coming to understand the awful waste of human lives through neglect. Thousands of lives are snuffed out every year in the United States by preventable maladies, most of these caused by disease germs that have entered the body through the mouth, the gateway of the system. Here is where the kindly, sympathetic, and able dentist adds to our gladness, efficiency and length of days by his knowledge of, belief in, and intelligently applied dental righteousness.—CHAS. F. CROUCH, *American Dentist*.

Traumatic Malocclusion—Its Treatment.—The failure of teeth properly to occlude and articulate, from whatever cause, is universal. This condition comes as a result of uneven wear of the occlusal surfaces of teeth. It is present in pyorrhea cases and causes loss of contact-point. Irritation and partial destruction of the peridental membrane result in a disturbance of the forces which hold the tooth in position in its socket, and cause an uneven distribution of that force, hence the slight dislocation of the tooth—nature's way of attempting to protect itself against an irritant.

To my way of thinking, the way to correct this type of malocclusion and malarticulation in adults, after all other irritation has been removed, is by cutting down the opposing cusps of the affected teeth until the tension is fully relieved. In extreme cases, a few teeth had better be sacrificed to restore the occlusion of the remaining teeth. Patients wearing dentures opposing natural teeth often develop tooth-strain until a condition of pyorrhea develops. In that case, grind the cusps of teeth on the denture. In all cases where this excessive tooth-strain is present, from whatever cause, and whether resulting in gingivitis, dental caries, or pyorrhea, or whether present in a mouth where none of these conditions have as yet developed, grind the opposing cusps until all excessive strain on the opposing teeth has been fully removed.—H. H. SCHMIDT, *American Dentist*.

Implantation Contraindicated.—Attempts have been made to preserve the "vital element" in a tooth that was to be planted. The tooth has been extracted and sewed into a cock's comb, there to be kept "vital" until it was needed. Then it has been prepared in a 98° F. normal saline solution. Great care has been taken to avoid injury to the so-called vital cells in the cementum. I have boiled teeth from a half hour to an hour before implanting them. Now a boiled tooth is obviously a dead tooth, but it is not more dead than is the cock's comb tooth, or any other extracted tooth treated with a view to preserving "vital cells" in the cementum. Such teeth ankylose, as do boiled teeth. Irrespective of the technic used before plantation, the roots of planted teeth are absorbed. I have seen teeth transplanted by Dr. W. J. Younger roll into the mouth eight years after the transplantation; no roots were left; the crowns of the teeth were discolored and offensively odorous.—JOSIE NOVITZKY, *New York Medical Journal*.

Taking a Bite for Crown or Bridge Work.—One of the most difficult items in operative dentistry to contend with is the taking of a satisfactory bite, particularly where the occlusions are close. When the wax or compound bite is removed it often breaks in two pieces, making it difficult to obtain a perfect cast for the occluding surfaces to be articulated to the crown or bridge about to be constructed, or breaks when placed on the plaster model. Many ideas have been advanced for overcoming this, such as placing a piece of linen, cut about the length and width of the bite to be taken, then placing the wax above and below the piece of linen, taking the bite in the usual manner. The linen holds the bite together and prevents biting clear through. A better and more rapid way of obtaining this result is by the use of the Artic-Bite, a nifty little instrument in which all manner of hard, close, difficult articulations and bites can be obtained in two minutes' time without the possibility of a mistake. The inventor of the Artic-Bite is to be complimented.—W. E. BEACHLEY.

OUR ARMY AND NAVY

COMPILED BY LELAND BARRETT, D.D.S.

GENERAL PERSHING'S ADVICE TO SOLDIERS IN FRANCE

Le Figaro (Paris), under date of January 22, says:

In an order of the day recently addressed to his troops, General Pershing made the following recommendations, which are so excellent that we deem it advisable to approve them with all our hearts:

"Never forget that we are at war and that the enemy is on the watch. Always be restricted in your intercourse with families and never speak confidentially with a woman, because women are the most cunning of spies, and you may bestow your confidence upon one in the employ of the enemy.

"Never trust anyone who asks questions of a military character or who seems to be much interested in questions of such a nature, even though such a person appears to be an American officer.

"Any man, woman or child, or even a man wearing the uniform of an American, or in the uniform of a soldier of the allied armies, can be a spy.

"In fact, say nothing that you would not wish to reach the ears of the enemy. And for this same reason never enter into any correspondence with an unknown person, for this is one of the chief means used by the enemy to procure information.

"In the streets and in public places, do not fail to remember that the very walls have ears. Therefore do not express your opinion upon any military question or even on the war in general.

"Don't give the impression of a pessimistic view of the situation either by word or action and always have confidence in the success of our Army and of our cause."

* * *

Under date of March 29, the Postmaster-General issued an order stating that on and after April 1, 1918, parcels for members and individuals connected with the American Expeditionary Forces in Europe shall not be accepted for mailing or dispatching unless they contain such articles only as are being sent at the written request of the addressee, approved by his regimental or higher commander or an executive officer of the organization with which he is connected. In enforcing this order, postmasters are instructed to secure the assurance of the sender in each case, that all the articles contained in the parcels are sent at the addressee's approved written request, that such request is enclosed in the parcel, and to require the sender to place on the wrapper of the parcel under his name and address the following endorsement: "This parcel

contains only articles sent at the approved request of addressee, which is enclosed." The postoffice order is issued at the request of the War Department.

Journal of the A. M. A.

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ARMY MEDICAL CORPS

The retirement in October on account of age of Major-General W. C. Gorgas, surgeon-general of the Army, is anticipated in the conjecture which is rife concerning his successor. There are some interesting developments among prominent members of the medical profession, who are serving in the capacity of medical reservists, in favor of the selection of a reserve officer as the head of the medical department.

Army and Navy Register.

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COMMUTATION OF QUARTERS FOR OFFICERS

The President has signed the bill for commutation of quarters. The bill provides that "during the present emergency, every commissioned officer of the Army of the United States on duty in the field, on active duty without the territorial jurisdiction of the United States, who maintains a place of abode for a wife, child or dependent parent, shall be furnished at the place where he maintains such place of abode, without regard to personal quarters furnished him elsewhere, the number of rooms prescribed by the Act of March 2, 1907, to be occupied by, and only so long as occupied by, said wife, child or dependent parent; and in case such quarters are not available, every such commissioned officer shall be paid commutation thereof, and commutation of heat and light, at the rate authorized by law in cases where public quarters are not available; but nothing in this Act shall be so construed as to reduce the allowances now authorized by law for any person in the Army." This most important legislation is destined to relieve much real distress. Like much other legislation, the verbiage of the law is doubtful on some points and the comptroller has been asked to issue rulings and interpretation of the new legislation for the guidance of disbursing officers. The law was passed in order that officers who are compelled to maintain a residence for their dependents may receive commutation to help meet this drain on their resources. The question has arisen as to whether officers on duty abroad, who are provided with commutation of quarters, heat and light, for instance, in France, will also receive allowance for a family in this country. According to the *Army and Navy Register*, "It is hoped that the comptroller will decide that an officer may draw double commutation of quarters for the full number of rooms allowed for his grade with commutation of heat and light, for the number of rooms actually occupied abroad by himself, and the number of rooms actually occupied by the members of his family at home." Another question concerns the interpretation of the words "wife, child and dependent parent,"

and it is suggested that the latter term includes father, mother, grandfather, grandmother, step-father, step-mother, either of the officer or of his wife. For those physicians who do not understand the interpretation of the term "commutation of quarters," we may say that a commissioned officer on duty at a place at which no public quarters are available—such as an Army post—is entitled to commutation of quarters, which amount is added to the pay of the officer by the paymaster each month. The officer is also entitled to commutation for fuel and light, which is also entered on his voucher according to tables published in Army Regulations. The commutation consists of \$36 for first lieutenant, \$48 for captain and \$60 for major. As will also be seen from the text of the law, this commutation of quarters is not paid to unmarried officers unless they maintain a home for a dependent parent.

Journal of the A. M. A.

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MEDICAL STUDENTS COMMISSIONED

Under a recent arrangement between the Navy and War Departments, the privilege has been extended to enrolled medical and dental students to accept commissions in the Medical Corps of either branch of the service. The privilege applies to either the Army or the Navy; that is, an enrolled medical student of the naval reserve force may accept a commission in the Medical Reserve Corps of the Army, and vice versa.

Army and Navy Register.

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UNIFORMS AT COST FOR ARMY OFFICERS

Officers of the Army in Washington will by May 10, according to the present plans of Colonel George F. Downey, depot quartermaster, have an opportunity to purchase uniforms and certain articles of equipment at contract prices.

Army and Navy Register.

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MEDICAL DEPARTMENT TRAINING

The first class of dental officers to be sent to the medical officers' training camp at Fort Oglethorpe, Ga., will commence the course of instruction March 15. The course will last for two months. During the first month, about 180 hours will be devoted to general military subjects and during the second month about 71 hours to these subjects and 100 hours to special dental subjects. The military staff already at the training camp will conduct the military instruction. Lieutenant-Colonel John H. Snapp, dental corps, has been relieved from duty at Camp Upton, N. Y., and assigned to duty as senior dental instructor at Fort Oglethorpe. He will be assisted by several members of the dental corps and by a staff of members of the dental reserve corps who have had experience, before entering the military service, as special instructors at dental colleges. It is planned to send to the camp each month a class

of about 85 dentists, of whom all that can be spared from their present duties will be recent appointees to the dental corps, with a sufficient number from the dental reserve corps to make up the prescribed number.

Army and Navy Register.

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Funk & Wagnalls Co., of New York, has published a little book entitled "Health for the Soldier and Sailor"; price, sixty cents. The authors are Professor Irving Fisher, of Yale, and Eugene L. Fisk, M.D. The present volume, handily bound in khaki cloth, pocket size, is packed with matter of vital importance to the health of our men in camps, on shipboard, and on the firing line, every one of whom should have a copy in his kit.

* * *

ARMY DENTAL SURGEONS

Following is a list of candidates who have qualified in the recent examination for appointment to commissions in the Regular Army Dental Corps. Recommendations will be made for the commissioning of these officers as first lieutenants. There will remain seventy-five vacancies in the corps after these appointments are made:

1. John Rudolph Wikeen.
2. Richard Carlton Hoblitzell.
3. Carl Eaton Safford.
4. Charles Jefferson Denholm.
5. Harry Holmes.
6. Elmer H. Nicklies.
7. Harold Jensen.
8. William Edward Blurock.
9. Daniel Sumner Lockwood.
10. Thomas Winton Deyton.
11. James Barto Mann.
12. Avery Scott Hills.
13. George Mason Babbitt.
14. Judge William Fowler.
15. Francis Stone Adams.
16. Archie T. McGuinness.
17. Carl Howard West.
18. Edwin M. Kennedy.
19. Merle W. Catterlin.
20. Thomas Minyard Page.
21. Clarence Pefferce Jackson.
22. Chester Bumgardner Parkinson.
23. Herbert Edwin Guthrie.
24. James Harold Keith.

Army and Navy Register.

ADDITIONAL DENTISTS FOR DIVISIONS

Authority has been given by the War Department for increase of the allowance of dental personnel for the divisions about to depart for France. Such divisions will have 31 dental officers and 32 enlisted men as dentists' assistants, in place of the former allowance of 25 of each class. The allowance of dental officers as prescribed by law for the Regular Army is one per thousand of the regular commissioned and enlisted personnel of the line and staff, and this ratio has been maintained in placing members of the dental reserve corps and of the dental corps of the National Army on active service. The dentists believe that this allowance is too small, and basing their estimates on the average in private practice they are advocating an allowance of three dental officers per thousand of the personnel of the military establishment. The allowance of 31 dental officers to an overseas division gives less than two per thousand. A new class of recently appointed members of the regular dental corps and of the dental reserve corps commenced a two months' course of instruction at Fort Oglethorpe, Ga., on April 15.

Army and Navy Register:

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Appointments, orders and promotions as published by the *Army and Navy Register*:

DENTAL CORPS

Feb. 23, 1918

The following appointments in dental corps announced: To be first lieutenants, 1st Lieut. John G. Urban, dental reserve corps; Carl S. Emert, of Indiana; 1st Lieut. Wm. H. Siefert, dental reserve corps; Samuel J. Lewis, of Michigan; 1st Lieut. James H. O'Reilly, dental reserve corps; Frederick W. Miller, of Missouri; James A. Curtis, Jr., of Georgia; 1st Lieut. James J. Weeks, dental reserve corps; John N. White, of Kentucky; 1st Lieut. Homer L. Sams, dental reserve corps; George M. Krough, of Minnesota; 1st Lieut. Wayne W. Wolley, dental reserve corps; 1st Lieut. Edward W. Barr, dental reserve corps; 1st Lieut. Fernando E. Rodriguez, dental reserve corps; 1st Lieut. John L. Davis, dental reserve corps; 1st Lieut. Joseph H. Jaffer, dental reserve corps; Adolph A. Meyer, of California; 1st Lieut. Howard C. Feyler, dental reserve corps; Wm. F. Scheumann, of Indiana; 1st Lieut. Alonzo G. McCue, Jr., dental reserve corps; Campbell H. Glascock, of Missouri; 1st Lieut. Austin F. Roberts, dental reserve corps; Wm. F. Wleck, of Texas; Thomas H. Veale, of Massachusetts; 1st Lieut. Lawrence J. Dunn, dental reserve corps; Carl R. Oman, of Washington; 1st Lieut. Leslie A. Gould, dental reserve corps, and Harold A. Curtis, of New York.

Maj. Arthur J. Skillman to Chillicothe, Ohio, Camp Sherman, for duty.

DENTAL CORPS

March 2, 1918

Lieut. Col. John H. Snapp from duty at Camp Upton, N. Y., to Fort Oglethorpe, medical officers' training camp, for duty as senior dental instructor.

DENTAL RESERVE CORPS

Promotions of following-named first lieutenants to grade of major announced: Archibald L. Miller, Albert Mehrer, Walter H. Richardson, Grove W. Dunham, Sherman M. Fowler, Donald D. Cornell, Ernest O. Lawing and John Voss.

Appointment of following to grade of captain announced: 1st Lieuts. Edwin H. Smith, Charles W. Swing, Philip H. Woods, Walter E. Lotz, Wm. G. Buchanan, Wm. W. Peebles, James E. Johnson, Theron J. Hickey, George A. Withrow, James T. Cannon, Walter LeR. Wilson, Victor I. Buss, Floyd E. West, Wm. E. Cashin, Arthur A. Hoffman, Albert W. Anderson, Wm. E. Boyle, Edgar T. Blocher, George H. Elliott, Charles H. Masters, Charles A. McDermant, Frank

R. Woods, James W. Ferguson, DeWilton H. Milstead, Jesse J. Corlew, John F. Clark, Edward F. Lafitte, Edwin C. Baker, Louis A. Haffner, Louis H. Cadereite, Joseph A. Corriveau.

George V. Cannon, Wm. M. Bergan, Irving P. Carr, James E. Cox, George N. Abbott, David S. Bedrick, Wilbur A. Charron, Wm. L. Davidson, Wm. P. Delafield, Wm. A. Walzem, Milton H. Anderson, Walter Sorenson, Charles J. Meyer, Thomas J. Guilfoil, James H. Keith, Walter Grandage, Thomas E. Power, Frederick W. Day, Wm. B. Cobb, John J. Lally, Frank L. Hardy, Wm. R. Beattie, Sperry B. Claypool, Roy A. Stout, Albert E. Thornberry, Shubael C. Stratton, Albert W. Farley, Warren E. Guerrier, Cornelius Locke, Harrison B. Wall, Clarence P. Landgrebe, Oakley B. Davy, Max C. Frazier, Charles F. Huber, Claude L. Hunsicker, James W. McGuire, Thomas L. Rice and Stanton L. Sherman.

DENTAL CORPS

March 16, 1918

Lieut. Col. George E. Stallman (promoted subject to examination), having been examined for promotion and found physically disqualified for duties of lieutenant colonel in dental corps by reason of disability incident to service, his retirement as a lieutenant colonel is announced. He will proceed to his home.

Maj. Arthur J. Skillman to Camp Sherman, Ohio, for duty in base hospital.

1st Lieut. Julius L. Bischof from Evans Dental Institute, Philadelphia, to Camp Joseph E. Johnston, Fla., for temporary duty in base hospital.

The following to Fort Oglethorpe, medical officers' training camp, for duty: 1st Lieuts. Wm. F. Scheumann and John N. White.

The following to Fort Oglethorpe, medical officers' training camp, for course of instruction: 1st Lieuts. Harold A. Curtis, Lawrence J. Dunn, Carl R. Oman, John L. Richards, Thomas H. Veale and Carl S. Emmer.

DENTAL RESERVE CORPS

Appointment (promotion) of following first lieutenants to grade of major announced: Joseph A. Boarts and John McD. Eveleth.

DENTAL CORPS

March 19, 1918

Leave for three months on surgeon's certificate granted Lieut. Col. Raymond E. Ingalls.

DENTAL RESERVE CORPS

Appointment (promotion) of 1st Lieut. Joseph D. Eby to grade of major announced.

Capt. Cornelius Locke to Panama Canal Department for duty.

Appointment of following-named lieutenants to grade of captain announced: Daniel T. Bowers, David G. Everhart, Melvin M. Augenstein, Wm. O. Boss, Fred Tiesse, Jr., John C. McElhaney, Wm. B. Noble, Denzil C. Barnhill, Ernest E. Boyd, Albert L. Bruener, Walter T. Clark and Gordon L. Ross.

Appointment of 1st Lieuts. Oscar Le Roy Whitson, Ernest Eugene Buell, Harry Paulus Bachman, and Wilbert J. Scruton to grade of major announced.

DENTAL CORPS

March 23, 1918

Maj. Richard B. Clark from duty in Hawaiian Department to San Francisco.

The following from present duties to Fort Oglethorpe for duty as instructors: Maj. Ben H. Sherrard and E. Henry Valentine.

The following to Fort Oglethorpe for course of instruction: Maj. Thomas L. Smith, 1st Lieuts. Alvin E. Anthony, Leslie D. Baskin, Jacob L. Brause, Arthur T. Burchill, Albert S. Cumming, Frederick C. Daniels, Alvin D. Danheisser, Benjamin H. Dean, James E. Dean, Chester Denham, Melvin R. Eiche, Harold S. Embree, Raymond H. Fisher, Jerome L. Fritsche, Dell S. Gray, Leroy P. Hartley, Wm. H. Hoblitzell, Henry L. Hogan, Avery G. Holmes, Clarence R. Jacobson, George R. Kennebeck, Hooker O. Lindsey, Lewis W. Maly, James B. Manning, Neil J. McCollum, Roy R. Newman, James H. O'Reilly, Harold J. Parker, Adrian C. Ragan, Fletcher D. Rhodes, Fernando T. Rodriguez, Walter A. Rose, John A. Rowe, Roy C. Starr, Eugene A. Smith, Wm. B. Stewart, Robert L. Strickland, Richard F. Thompson, Lynn H. Tingay and Walter D. Vail.

DENTAL RESERVE CORPS

Capt. Fred Tiesse, Jr., to Washington, 50th infantry camp, East Potomac Park, for duty.

The following to Fort Oglethorpe for course of instruction: Capt. Floyd E. West, 1st Lieuts. Guy P. Bannister, Wm. R. Beattie, Albert J. T. Beatty, Francis A. Boylan, Wm. Z. Carroll, Walter T. Clark, John F. Connolly, Donald D. Cornell, Thomas Crenshaw, Jr., James G. Crutchfield, Charles E. Davis, Joseph D. Eby, George H. Elliot, Max C. Frazier, Walton J. Graft, James F. Hannon, Edger T. Haynes, James H. Keith, Floyd D. Leach, Edward B. Lodge.

Jerome B. Marshall, Walter F. Neuboff, Arthur H. Nobbs, Henry W. Rich, George E. Roland, Wm. J. Stark, Roy A. Stout, Wm. V. Thomson, Harry M. Trafford, Raymond L. White and Walter L. Wilson..

DENTAL CORPS

March 30, 1918

Col. Wm. H. Chambers from duty at Presidio of San Francisco to Fort McPherson, general hospital 6, for temporary duty.

DENTAL RESERVE CORPS

Following appointments (promotions) announced:

To be majors: 1st Lieuts. Earl C. Braniger, Henry W. Rich, and Guy P. Bannister.

To be captains: 1st Lieuts. John P. Garriott, Jesse L. Meredith, Alphonse L. Senecal, William V. Thomson, Thomas M. Terry, Smith C. Tanner, Walter F. Clayton, Robert H. Nones, Jr., and Royal E. Wight.

Capt. Walter Sorenson to Fort McHenry, Md., general hospital 2, for duty.

DENTAL RESERVE CORPS

April 6, 1918

Following appointments (promotions) announced: To be captains: 1st Lieuts. Perry Haskell Plummer, Kenneth F. Smith, Austin R. Killian, John C. Gallagher and Frank W. Gale.

DENTAL CORPS

April 13, 1918

Col. Wm. H. Chambers from duty at Presidio of San Francisco to Fort McPherson, general hospital, for duty.

Col. Julian R. Bernheim report to surgeon general for duty in his office.

Leave for three months granted Maj. J. Craig King on surgeon's certificate.

1st Lieut. Wm. F. Wieck to Fort Oglethorpe for course of instruction.

DENTAL RESERVE CORPS

The following appointments (promotions) announced: To be captains, 1st Lieuts. James B. Davidson, Arthur Lankford, John F. Ackley, Rae P. McGee, Wm. C. Speakman, Stewart D. Ruggles, Gerald G. Burns, Harry B. Butler, Gregory P. Cassidy, James L. Clements, Roscoe L. Barber, George A. Hewey, Ozias Paquin, Jr., Nathaniel Barnard, Leonard G. Mitchell, Edward E. P. Sleppy, Frank D. Pierce, Robert R. Luce, Frank P. Gormley, John J. W. Ross and Ivan E. Smith.

DENTAL CORPS

April 20, 1918

Maj. Gerald D. Byrne from duty at Letterman General Hospital, San Francisco, to Fort Riley, Camp Funston, for duty.

The following to Fort Oglethorpe, medical officers' training camp, for course of instruction and return to stations: Majs. Earp T. Dickmann, Wilfurth Hellman, Samuel Kaufman, Charles C. Mann, Lee B. Schrader, Walter S. Smith and George R. Tressel; 1st Lieuts. Alvin E. Anthony, Wm. J. R. Akeroyd, Leslie D. Baskin, Clinton R. Boone, Joseph L. Boyd, Wm. B. Caldwell, Dell S. Gray, Curtis W. Hallam, Timothy Harden, Leslie S. Harlan, Winfred E. Henshaw, Claude R. Hollister, Glover Johns, Roy M. Kisner, Timothy F. Leary, Milton A. Price, Joseph L. Ralm, Samuel J. Rohde, Walter A. Rose, Wm. H. Siefert, Alexander M. Smith, Jr., Boyd L. Smith, Edward A. Thorne, Wm. T. Williams, Clarence J. Wright and Cecil R. Hays.

DENTAL RESERVE CORPS

Capt. Wm. E. Beard to Fort Leavenworth for duty.

Capt. Claude L. Hunsicker to base hospital, Fort Des Moines, for duty.

Appointment of 1st Lieut. Wm. McDougall to captain announced.

Appointments of 1st Lieuts. James P. Harper and William A. Heckard to major announced.

Appointments of following-named first lieutenants to captain announced: James H. Reid, Henry D. Rand, Ormsby Keselring, Paul S. Harner, Lloyd W. Bentley, Frank A. Clear, Weston B. Estes, Edward B. Lodge, Crittenden Van Wyck, Charles A. Couplin, Joseph P. Collins, Franklin M. Huson, David A. Proctor, Fred C. Sizelan, Charles Steffens, Douglas D. Godwin, William A. Spence, Lee F. Strickler, James A. Johnson, Carl A. Anderson, Herman E. Tipton, Chester M. Meares, Earl J. Hill, Milfred I. Merritt, Thomas F. Montgomery, Harry F. Gravelle, Earle N. Hoopman and Joshua H. Gaskill.

DENTAL RESERVE CORPS

April 27, 1918

The following appointments announced: To be captains: 1st Lieuts. Guy W. Angelo, Edward R. Danforth, Charles J. Denholm, James B. Harrington,

Frank E. Hendrickson, Miguel W. Jackson, James B. Jones, George R. Lee, Ralph D. Linn, Elbert W. King, Frank B. McAdams, Earl N. McCue and Forest DeW. Suggs.

DENTAL CORPS

May 4, 1918

1st Lieut. William A. Moore to Fort Crockett, Tex., for duty in coast defenses of Galveston.

DENTAL RESERVE CORPS

The following appointments announced:

To be major: 1st Lieut. Otis H. McDonald.

To be captains: 1st Lieuts. Clarence J. Appleget, Albert J. T. Beatty, John E. Frates, Walton J. Graft, John W. Leggett, William B. Ley, Claude E. Markey, Wegor E. Mathison, Robert W. Meeker, Clinton T. Messner, Henley E. Miller, William L. Nance, Gilbert L. Walker, Raymond L. Anglemire, John T. Ashton, George F. Brand, Thew J. Ice, Clarence P. Jackson, Justin E. Nyce, Harry W. Porter, Floyd D. Soverel.

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PERSONNEL OF THE MEDICAL DEPARTMENT

For the week ending April 19, 1918, the personnel of the Medical Department of the Army included:

Medical Corps; 843, including 1 major-general, 66 colonels, 102 lieutenant-colonels, 195 majors, 2 captains and 477 lieutenants.

Medical Reserve Corps: 18,651, including 1,194 majors, 4,418 captains and 13,039 lieutenants. On active duty: 16,042, including 1,063 majors, 3,949 captains and 11,030 lieutenants.

Medical Corps, National Guard: 1,207, including 16 lieutenant-colonels, 249 majors, 150 captains and 792 lieutenants.

Medical Corps, National Army: 111, including 3 brigadier-generals, 11 colonels, 89 lieutenant-colonels and 8 majors.

Dental Corps, 209; Dental Reserve Corps, 5,207; of whom 1,357 are on active duty; Dental Corps, N. G., 259; Veterinary Corps, 18; Veterinary Reserve Corps, 1,432, of whom 823 are on active duty; Veterinary Corps, N. G., 51; Veterinary Corps, N. A., 374; Sanitary Corps, 1,028, and Ambulance Service, 154, constitute the remainder of the commissioned personnel.

The discharges in all branches of the service to date are:

Causes.	Number			
	M. R. C.	M. C. N. G.	D. C. N. G.	San. C.
Duty completed	1	0	0	0
Physical disability	532	42	7	6
Inaptitude	213	16	0	1
Other branches of service.....	443	61	7	59
Domestic troubles	52	1	0	1
Resignations	166	45	5	6
Needed by community.....	36	1	0	0
Deaths	52	3	0	1
Dismissals	3	2	0	0
Good of service.....	0	1	0	1
	1,598	172	19	75

Army and Navy Register.

NAVAL DENTAL CORPS

The Navy Department has decided that the act of August 29, 1916, does not, of its own vigor, vest in an acting assistant dental surgeon, appointed under the act of August 22, 1912, the office of dental surgeon (permanent) with the right of advancement to the rank of lieutenant after five years' service (including service as an acting assistant dental surgeon). The power of appointment was left where it would have been without the specific provision made in this case, namely, in the President.

PREPAREDNESS LEAGUE NOTES AND NEWS

By R. OTTOLENGUI, *Publicity Committee*

REPORT FROM THE PRESIDENT**OUR NEXT MOVE**

We do not want members of the League to get the idea that the great drive now going on to help make our National Army dentally fit is the sole object of our organization. It is but one of a series of our activities. The development of our dental motor car is a signal illustration of the great possibilities before us.

Those of us who are not commissioned, and who continue in civil practice, must devote our energies to preparing to give expert services to our soldiers who have been injured in battle. We will find ourselves in need of all the skill we can summon, therefore I would impress upon our members the great advantage of forming sectional units of the League throughout the whole country for the study of war oral and dental surgery. We are proud to say that our dental reserve is over-filled, and service in that direction is amply provided for. However, if later on more are needed, the study course will the better prepare us. I therefore strongly urge the promotion of this object, and point with pride to the splendid record the League has already made in that direction. More than one hundred sectional units have given such a course, which has been the means of assisting several hundred to pass examinations to the reserve corps, as well as promoting their advancement to higher commissions and positions in the service.

"Knowledge is power," and is the best weapon at our command to overcome the results of disaster. It is our duty to marshal our forces as rapidly as possible for this object, as already our boys are beginning to return sadly in need of our best service, and the great battle which has been fought will bring thousands upon thousands to whom we must minister. Every dentist, whether or not a member of the League, should make this a personal matter, and if not near a League unit, interest him-

self in forming one in his neighborhood, and we will gladly supply all information and give the needed assistance.

Awaken to this call and put your shoulder to the wheel, otherwise *you may realize later that you have not done all you might have done for your country.* By communicating with the office of the president, 131 Allen street, Buffalo, N. Y., you will receive full instruction as to the method of procedure.

LECTURE AND SLIDES

The League has prepared a synopsis lecture, accompanied by slides showing cases of Plastic and Oral Surgery before and after treatment, a series covering our Free Dental Activities, and a third, showing our new Dental Motor Car.

Assignments may be made through the office of the president, 131 Allen street, Buffalo, N. Y.

IMPORTANT NOTICE

It has come to the attention of the President of the League that a pamphlet is being circulated advising our members to charge selective service men who are able to pay for the service necessary to make them dentally fit.

This pamphlet is *spurious*, and the originators deserve no better treatment than internment during the war as cohorts of the Kaiser. It is but another vain attempt to abort the principles upon which the League is founded, and which will live for ages after the perpetrators of this un-American and despicable subterfuge have become naught but a blotch of mold upon our fair soil and the unfairly acquired gain has been dissipated without benefit to themselves or their families.

I trust all loyal dentists will exert themselves to give this stigma the lie by strictly adhering to the only principle that can make our organization live and be of vital importance to humanity and our country in this great crisis.

J. W. BEACH, *President.*

REPORT FROM THE DIRECTOR-GENERAL

DENTAL REQUIREMENTS AND EMERGENCY WORK

There seems to be a misunderstanding on the part of some as to what the dental requirements are to fit a man for *general* military service. He must have six opposing incisors and six opposing masticating teeth (either bicuspid or molars). These bicuspid or molars may be all on one side or part on each side, but there must be at least three above and three below, each of which must touch some tooth on the opposite jaw.

The most important thing to do for these men is to rid their mouths of bad roots and infected teeth, or any tooth having a history of periodical abscess. After the mouths are freed from infection and the gums healed, plates can be made by members of the League who desire to do

so, or they can be made after reaching the cantonments, if the officer in charge deems it necessary. The mouths, however, must *first* be made free from infection. Then, if possible, any large cavities in the remaining teeth should be filled and the teeth cleaned.

The lack of the minimum number of teeth (six and six) does not excuse any man from *military* service, but only from general military service. The man who has less teeth than the minimum required for *general* military service can be accepted (if otherwise fit) for limited military service, even if he has *no* teeth. These men for limited military service will cook food, drive wagons and auto trucks, carry supplies, work in factories, shops, or storehouses, etc.

CHAS. F. ASH, *Director-general*.

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The League has a membership to date of 13,600. Is *your* name among them? If not, send your name and one dollar, to Dr. Leuman Waugh, 576 Fifth avenue, New York.

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The Director-general reports: "We are receiving many letters in which the writer says he has sent in his dollar but has not received his button. Owing to the large number of applications received, running into the thousands, it requires considerable time to tabulate their names and get out the acknowledgements. Also, there are not enough buttons on hand and more have been ordered. We ask indulgence in this matter."

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MEDICAL ADVISORY BOARD WORK

During February, a meeting of the fifty dentists assigned to Medical Advisory Boards in New York City was called, and an organization was perfected under the name, "The Dental Committee of the New York Medical Advisory Boards." By this meeting a more co-ordinate plan of procedure was perfected. By the time of the next big draft we hope to have dentists on all the Local Exemption Boards. It was a satisfaction at the first meeting of the Dental Committee of the New York Medical Advisory Boards to find that everyone was already a member of the League.

LOCAL EXEMPTION BOARDS

As the Local Exemption Boards will select the majority of the men accepted for active duty, and as these are exactly the men for whom the League desires to work, it is manifest that as quickly as possible we should have dentists on all Exemption Boards throughout the country. This has already been accomplished in most states, and strenuous efforts are being made to have such appointments made in all states. Therefore, to facilitate progress, it would be well for every State Director to begin at once making out lists of men who would volunteer for this patriotic duty. It would perhaps be best to ask the Presidents of local societies to select these men. Do it now! Then when the Government announces that ap-

pointments to your Local Boards will be made, and asks for a list of men, you can forward your list by return mail. That would be impressive! That would be efficiency!

R. OTTOLENGUI,
Director of Publicity.

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NOTES AND NEWS

Who should receive the services of the members of the League? Every worthy man within the draft age whether he may or may not be in the service of his country at the time.

Let us forget all but the one thought—that we must do our utmost to help strengthen our great National Army. We must help make fighters to protect our flag and we must do it NOW. To-morrow may be too late.

One of our members recently arose at 3 A. M. and worked until 5 that one of "our boys" might go away in comfort. It is noble work and thousands of instances similar to this one might be related. The pride we feel in the way our profession is meeting the crisis cannot be expressed in mere words.

Every man you make dentally fit will fight for you in France.

HAVE AN ARMY OF YOUR OWN

It is well, perhaps, at this time to remind our members that all dental service rendered in the name of the League must be free. There can be no deviation from this rule without nullifying the great principle upon which our organization is founded.

We are rendering an inestimable service to our country and when we shall have completed our work, let it be said that we gave freely, gladly and with true patriotic spirit.

Our third annual meeting will be held on August 7th, in conjunction with the National Dental Association, Chicago, Ill.

We are arranging a program which will be of absorbing interest and urge every member who belongs to the N. D. A. to join us in the enjoyment of the good things we are preparing.

J. W. BEACH.

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Making appointments with individuals in the draft is, I think, not practicable for the reason that it is only through organized channels that the dentists offering their services can be assigned their fair proportion of the work. If work was continued on each mouth until it was put in good condition, it would result to the advantage of the few and the disadvantage of the many. If a Registrant needs a second or third appointment to make his mouth dentally fit, refer him back to the League's Headquarters for such appointments, and if time permits, there is no doubt but that he will be taken care of; meanwhile, those who come after him are not being neglected.

On the other hand, if a Registrant requires a second or third appoint-

ment and the dental operator is interested enough in his case to finish the work, then additional appointments may be made with the Registrant providing they do not interfere with the time he has already pledged the League. In other words, only one hour is to be given each Registrant unless other provision has been made for him either by the dental operator or by the Preparedness League. The *once over* for each Registrant is the important thing to be borne in mind.

When appointments, either first or second, are not kept, the result, of course, is loss of time. When this happens it is unfortunate and must be considered a part of our personal sacrifice, as there seems to be no way to guard against it. New appointments should not be given those who break their first appointments, but they should be referred back to the League's Headquarters and sent back to the State Director.

CHAS. F. ASH.

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Each dentist should chart the operations performed, sign his name and apply the Stickers furnished by each State Director or County Director. If the operator has no Sticker, cross out the name of the Selective on the address side and write Major W. A. Heckard, D. R. C., 50 East 42nd Street, New York City, across the card and mail at once.

When the work on each Registrant is finished, it should be recorded on Form 18 Card and when this Form 18 Card is filled up and duly signed it should be dropped in the box and sent back to the State Director. Each Card takes care of itself and records work done to date.

R. OTTOLENGUI,
Director of Publicity.

CURRENT NEWS

Items of professional news, of general interest, will be welcomed by Dr. Leland Barrett, at 220 West Ninety-eighth Street, New York City.

DEFEAT OF THE TAGGART PROCESS PATENTS

In a voluminous decision, covering some thirty-two typewritten pages, Judge Geiger of the United States District Court, in the case of the Dentists Mutual Protective Alliance *vs.* Wm. H. Taggart, has decided in favor of the Alliance.

Dr. Taggart brought suit against 523 dentists in 1914. When the case came to trial in June 1915, the attorneys for the Alliance moved to have all the suits dismissed on the ground that these men could not be sued collectively, and that by such tactics the Taggart attorneys were trying to intimidate the dentists of the country.

In this the Court agreed and Taggart's attorneys were told to select one case and go ahead. The Dental Protective Alliance being desirous of making it a test case, furnished twelve volunteer cases to cover the whole field of infringement of the Taggart patents. Although the decision is that of a District Appellate Court, it is in effect final, as the District Courts by virtue of the "Rule of Comity" would accept the decision unless entirely new evidence was presented.

In Judge Geiger's decision, the Alliance is sustained in practically every point, and the decision should settle for all time the standing of the Process patent in dentistry. Fortunately there has been no personal feeling against Dr. Taggart, a man of conceded ability and genius, and for whom the dental profession has great respect. It is a matter of pride that the members of the dental profession have made this fight, and paid for it themselves, independent of the dental trade.

To Dr. M. D. K. Bremner, President of the Alliance, is due most of the credit. He has worked unceasingly under great discouragements, and handicapped by a lack of interest of the profession.

The Alliance is composed of five thousand dentists, located in eighteen states, mostly of the West, who have contributed ten dollars each. —Editorial, *Oral Hygiene*.

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Isaac Marcossou in the *Saturday Evening Post*, February 9th, "France and Its Future," says:

"I have seen hundreds of shell factories in this war, ranging from Petrograd to Milan; but I have yet to see a more perfectly organized

or more highly specialized establishment than the huge plant which bears Citroen's name, and which now covers a space that would correspond to more than five big city blocks in the United States.

We think we represent the last word in welfare work; but we are very much mistaken. At the Citroen factory there is a complete dental clinic, presided over by three graduate American dentists, assisted by a dozen trained nurses, three of them from New York. Into this clinic at all hours of the day stream men and women workers, who are required to undergo a periodical examination of their teeth. *All* dental work is done at the expense of the company.

I asked Citroen why he set up this dental establishment. Quick as a flash, he replied: "Most of the human ills are due to bad digestion, and bad digestion, in turn, comes from lack of mastication. If your worker's teeth are in good shape he can chew and enjoy good food. When the eating machinery is in good repair, the human being is much more fit. One of the best human investments I ever made was to take care of my employees' teeth."

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Among the cities in the state of Wisconsin having provision for free dental work for schoolchildren not able to pay for such work are Milwaukee, Oshkosh, Racine, Janesville, Madison and Wausau.—*Journal of A. M. A.*

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WASHINGTON, May 6.—Men raised under the draft can be sent anywhere in the world to fight for the United States, the Supreme Court today decided. This action upholds the selective draft law in every particular.

The right of Congress to conscript men for foreign service was attacked by Robert Cox, Kansas City, draftee, sent to Camp Funston. He asked for a writ of habeas corpus directing Major Gen. Leonard Wood, in command of the camp, to release him from service on the ground that there was no constitutional right to compel him to fight in foreign lands. This was denied by a Kansas court.—*New York World.*

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New Clinic for Rehabilitation of Injured Soldiers.—Through the beneficence of an anonymous donor, New York is to have a new clinic and hospital devoted to the functional reeducation of maimed military men and civilians. The institution is to be opened within six weeks and will occupy a part of the plant formerly used by the New York Infirmary for Women and Children at Stuyvesant Square and Fifteenth Street. The institution is to be known as the New York Clinic for Functional Reeducation of Disabled Soldiers, Sailors and Civilians. The president of the organization is Dr. W. Gilman Thompson.—*Journal of the A. M. A.*

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Gifts Wanted for Columbia War Hospital.—Base Hospital No. 1,

the Columbia War Hospital, announces that it is now caring for 600 men from overseas and from the various cantonments in this country and that certain gifts will be acceptable. Among the articles particularly desired are the following: talking machines, with records; bookcases and books, games, wicker chairs, playing cards, tobacco, jellies, jams and fruits.—*Journal of the A. M. A.*

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EIGHTY-FIRST DIVISION, CAMP JACKSON, COLUMBIA, S. C.

April 9, 1918.—If there was ever a transformation in a place, it is in the site occupied by Camp Jackson. Everything that is conducive to health—climate, soil, drainage, water—is found here; everywhere activity is increasing and more efficient. The health of the division is good. System and uniformity of action are increasing. The base hospital is expanding to 2,600 beds. There are Red Cross buildings, the Y. M. C. A., and the Hostess House. Officers' quarters are enlarged. Many new officers are arriving every day.

Capt. Harrison A. Greaves of Philadelphia is chief of the roentgen-ray department. A powerful 10 kilowatt interrupterless machine, vertical and horizontal fluoroscopes, plate changers and gas and Coolidge tubes, and a localizer for foreign bodies in the eye are included in the excellent equipment. Hundreds of men have been examined for tuberculosis and heart lesions. Stereoscopic plates are made whereby the most delicate lesions of early tuberculosis may be detected. Nearly a thousand examinations of the teeth have been made for focal infection, filling defects before and after, abscesses and impacted molars.

All the men referred by the various specialists, tuberculosis, medical, surgical, eye, ear, nose and throat, have been successfully examined.—*Journal of the A. M. A.*

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Examination by the National Board of Medical Examiners, and its certificate of proficiency, now carries with it the right to engage in medical practice in fourteen states without the necessity for undergoing local examination by state boards. Fourteen more are expected to offer similar concessions as soon as their legislatures meet and opportunity is had to amend the laws accordingly. Others will doubtless follow.

Subject to physical examination and grading for aptitude, the examination by the National Board is accepted for admission into the Medical Department of the Army and Navy, and the Public Health Service.

Steps are being taken to secure reciprocity as to medical examinations with Canada; and if the present examinations warrant, it is contemplated holding them overseas with a view to impressing the medical authorities of Great Britain and France, and securing therefrom reciprocity entitling approved candidates to practice their profession in those countries.

In the readjustment of the profession which will inevitably occur

during and after the present war, many medical officers will doubtless change their residential state or country and desire to establish themselves in practice elsewhere.—*Journal of the A. M. A.*

Is not this plan a possibility of the future in dental license examinations as well?—L. B.

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The Kings County Medical Society, at a meeting at No. 1313 Bedford Avenue, Brooklyn, voted unanimously to drop Dr. James Peter Warbasse from its roster.

This action was taken after it had been stated that Dr. Warbasse was a pacifist, against compulsory military training, and had contributed an article in accord with his views to a medical journal.

The offending paragraph, read at the meeting, was as follows:

"Furthermore, no one knows better than the physicians that the rich will be able to secure certificates of disability excusing them from service, while the poor man will not. We know how current and prevalent these documents will become, and what a fruitful source of income they will be."

It was also voted to submit a report of the action taken to Department of Justice officials.—*N. Y. World.*

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Infectious Ulceromembranous Stomatitis and Gingivitis.—One thousand men were examined by Bowman in camp, both clinically and bacteriologically, to learn, if possible, the number of men who cleaned their teeth carefully and the number of men who did not, and the number of men in each of these groups showing Vincent's organisms present in numbers sufficient to be diagnostic; also the numbers of cases of clinically infectious gingivitis in each of these groups. The men examined may be divided into two classes: those with clean and those with unclean teeth. In the first group there were 816 men, and 314, or 38.4 per cent., of these showed Vincent's organisms present, but very few in number; 20, or 6.4 per cent., showed large number of spirochetes and fusiform bacilli, and were, clinically, positive cases. In the second group there were 184 men, and 139, or 75.6 per cent., of these showed a few Vincent's organisms present; while in 59, or 32 per cent., the organisms were present in preponderating numbers, and these cases were all clinically positive. Thus it is shown that not only are Vincent's organisms much more prevalent in mouths in which the teeth are not cared for, but clinically infectious gingivitis is also much more prevalent, and corresponds practically with the bacteriologic findings. "Trench mouth" may be described as an infectious disease of the mucous membranes of the mouth due to a spirochete and fusiform bacillus (Vincent's organisms), causing severe inflammation which may progress to ulceration, accompanied by constitutional disturbances, such as fever, gastric disorder, loss of weight, and marked depression.—*Bulletin of Canadian Army Medical Corps, Ottawa.*

The following letter, and enclosure, received from Dr. William Rice, Dean, of Tufts Dental College, will serve to correct some false rumors lately current:

Dear Doctor: On account of the extravagant statements in the newspapers in regard to the seriousness of the fire which caused considerable damage to the building occupied by the Tufts College Dental School. I feel that the enclosed admirable statement published as an editorial in the *Boston Transcript* of April 29th, might properly be given space in your next issue as an item of news interesting to the profession. As a matter of fact, even our clinical facilities have not been seriously crippled and we were able to carry on uninterruptedly our work in all departments.

We have been in a measure repaid for our loss by the generous spirit shown by our sister school of Harvard University through Dean Smith, and also by a kindly offer from President Merlin of Boston University, both extending to us the use of their buildings and facilities, should we require them. This broad attitude and genuine professional spirit I am very glad to acknowledge.

Very truly yours,

WILLIAM RICE, D.M.D.,
Dean.

THE TUFTS DENTAL SCHOOL

It is good to know that the damage done the Tufts Dental School by yesterday's fire is less serious than this morning's reports seemed to indicate. In all probability the institution has suffered no positive crippling. The flames did especially attack that part of the medical school plant which is given over to dentistry, but they do not appear to have laid all of it low by any means. When accounts were cast up this morning it was seen to be only the dental clinic that was thoroughly wrecked, while other principal facilities of the school were left in a condition that can be quite quickly repaired. Barring only the occurrence of rain during this day, causing water damage before the exposed equipment can be brought under cover, Tufts will be able to continue this department under very nearly its normal conditions.

This turn of events is the more fortunate in view of the progress which the institution has lately made. The school has been grounding its technical instruction upon ever broader foundations of liberal education.—*Boston Transcript*.

* * * * *

For those interested, a résumé of the dental license requirements for 1918 of the various states of the country has been compiled by Dr. Alphonso Irwin, of Camden, N. J., and published in the *Dental Digest* for April, 1918.

* * * * *

It is likely by the time this is published, that platinum will be under Federal control. We may well learn to conserve it and to look for suitable substitutes for dental uses. We are informed that several firms are now at work on the problem.

* * * * *

Patriotic investors in War Savings Stamps should realize what each fifty dollars' worth may do.

It will protect 1,000 soldiers from smallpox and 666 from typhoid. It will assure the safety of 139 wounded soldiers from lockjaw, the germs of which swarm the Belgian soil.

It will render painless 400 operations, supply 2 miles of bandages—enough to bandage 555 wounds.

It will care for 160 injuries in the way of "first-aid packets."

It will furnish adhesive plaster and surgical gauze enough to benefit thousands of wounded soldiers.

Every purchaser of a War Savings Stamp performs a distinct individual service to his country and to our boys fighting in France.

BOOK REVIEWS

By HAROLD S. VAUGHAN, M.D., D.D.S.

SURGERY AND DISEASES OF THE MOUTH AND JAWS. By VILRAY PAPIN BLAIR, A.M., M.D., F.A.C.S., Professor of Oral Surgery in the Washington University Dental School and Associate in Surgery in the Washington University. Third Edition revised so as to incorporate the latest data concerning gunshot injuries of the face and jaws. Compiled by the section of Surgery of the Head, Subsection of Plastic and Oral Surgery, Office of the Surgeon-General of the Army, Washington, D. C. 733 pages, with 460 illustrations. St. Louis: C. B. Mosby Company, 1917.

This book, one of the clearest and most concise on face and jaw injuries, has been greatly improved by the addition of the more recent work on war injuries of the face and jaws.

The preliminary chapters on the anatomy of this region, inflammations, injections, sterilization, hemorrhage, shock, wounds and injuries form a sufficient review without taking up too much of the subject matter of the book.

The chapters on fractures of the upper and lower jaws have been rewritten and much new and valuable material added from the recent literature incident to war experience in this field. The care of the tissues, care of the mouth and feeding of the patient have received merited attention.

Chapter XIX on the repair of acquired defects has been further amplified. Chapter XXIV on the extraction of the teeth is somewhat elementary. The advice that "small fragments left in a non-infected socket may be eventually absorbed or thrown off" is objectionable in that the inexperienced operator gains a false sense of security from such advice.

The subject of local anesthesia has hardly been dealt with as fully as its importance merits.

The book is well written and is the best treatise we have on this subject. It can be heartily recommended to the specialist and advanced worker as well as to the undergraduate student.

MODERN DENTISTRY. By JOSEPH HEAD, M.D., D.D.S., Dentist to the Jefferson Hospital, Philadelphia. Octavo of 374 pages, with 309 illustrations. Philadelphia and London: W. B. Saunders Company, 1917; cloth, \$5.00 net.

The most striking quality of this interesting and valuable book is its originality. Dr. Head is well known throughout the dental world as an investigator in special problems, and in these pages appear the results of his researches, with his ingenious and positive views concerning dental practice in general. The studies of tooth enamel and of saliva—giving

data obtained by elaborate and highly delicate instruments devised by the author—of the prevention of mouth infection—of porcelain work—care of children's teeth—of experiments concerning strength, solubility and adhesiveness of various cements: these chapters almost bristle with facts obtained at first hand, and with opinions expressed with such conviction that the reader cannot fail to admire, even if he fails always to approve, the ingenuity and plausibility of the author's view.

We take pleasure in commending especially the excellent opening chapter on tooth cleanliness. Dr. Head is on sound ground when he urges the systematic daily use of the floss silk—in giving that instrument pre-eminence as a tooth cleanser. His detailed description of its use is valuable; for we regret the fact that the average dentist knows almost as little as the patient concerning the use of the silk as a daily, necessary operation in mouth hygiene.

We cannot follow the author so readily in his root-canal treatment and technic of filling the same. His advice in opening difficult canals, to *seal* 50 per cent sulphuric acid in the pulp chamber, until the following day, would probably lead, in some cases, to an accident once related by Dr. Calahan of a case in which that procedure was used by a careless operator: the crown of the tooth, next day, "came off." Dr. Head not only does not try to penetrate the root-end but takes care not to do so. He fears the consequences of the protrusion of any gutta percha at the apex and states, "it is better to only partially fill a sterilized canal than to project the filling through the tip." This strikes us as strange doctrine in these days of successful encapsulation of root apices. He does not speak of the use of metallic sodium and potassium in tracing canals.

Dr. Head ranks as a pioneer in porcelain work, and we are indebted to him for many clever adaptations of this material in filling and crown operations. "Hammered gold" fillings he condemns, and with them, apparently, all foil operations. We regret the dogmatic rather than judicial attitude in many parts of this book; still we believe it will be read very widely and valued as the work of an earnest though enthusiastic investigator and practitioner.

[W. B. D.]

NOTICES

NATIONAL DENTAL ASSOCIATION

SPECIAL ANNOUNCEMENT OF HOTELS AND GARAGES

The National Dental Association will hold its Twenty-second Annual Meeting in Chicago, August 5-9, 1918. The headquarters will be at the Auditorium and Congress Hotels, situated on Michigan Avenue, corner of Congress Street. All meetings, clinics and exhibits will be held in these two hotels, which are connected with an underground tunnel.

The important announcement at this time must be the warning "Reserve your rooms at once. Make reservations by mail direct to the hotel of your choice. Arrangements for parking cars should be made direct with the garage."

The following is a list of hotels and rates:

AUDITORIUM HOTEL, MICHIGAN BOULEVARD AND CONGRESS STREET

Single Room without bath, \$1.50 and \$2.00 per day.

Single Room with bath, \$2.50 to \$4.00 per day.

Double Room without bath, \$2.50 and \$3.00 per day.

Double Room with bath, \$4.00, \$5.00 and \$6.00 per day.

CONGRESS HOTEL AND ANNEX, MICHIGAN AVENUE AND CONGRESS STREET

Room, detached bath (One Person), \$2.00, \$2.50, \$3.00 per day.

Room, private bath (One Person), \$3.00, \$3.50, \$4.00, \$5.00, \$6.00 per day.

Room, detached bath (Two Persons), \$3.00, \$4.00, \$5.00 per day.

Room, private bath (Two Persons), \$5.00, \$6.00, \$7.00 per day.

Suites: Two connecting rooms, private bath (Two Persons), \$6.00 to \$10.00 per day.

Three or four persons, \$8.00 to \$14.00 per day.

Corner Suites: Parlor, bed room and private bath, \$10.00 to \$50.00 per day.

The following is a list of garages and rates:

Our rates for storage are \$1.00 for the first 24 hours, and 75 cents each additional 24 hours. At these rates cars can be taken out for driving and reparked during the same 24 hour period at same charge.

CITY AUTO PARKING COMPANY,
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Michigan Blvd. and Eighth St.

One thousand cars can be parked in Grant Park (on the Lake Front) free. The City of Chicago furnishes policemen to watch these cars.

J. P. BUCKLEY,
Chairman Publicity Committee.

GENERAL CLINIC

Arrangements are sufficiently advanced to promise the members of the Association that the General Clinic will be one of the great features of the 1918 meeting.

In conference with officers of the National Dental Association, the Committee in charge of the General Clinic carefully considered the nature to the clinic to be presented this year. After trying for the past few years new features in conducting the Clinic Program, it is the belief that a greater number will be served and benefited by holding a General Clinic, grouped into Sections: namely—Operative, Prosthetic, Crown and Bridge, Orthodontia and Prophylaxis.

To make it National in character, the Presidents of the different State Societies were requested to appoint two clinicians and two associates from their respective State Societies.

Up to date, thirty-nine State Societies are represented and the remaining nine will be before the publishing of the Official Program.

Far away Alaska is sending two clinicians and two associates, and to make the clinic more than National, in fact an allied affair, the Canadian Dental Association has promised ten of the best clinicians in the Dominion. In addition, there will be a few units which will demonstrate principles that require more than two men.

It is safe to say that this Clinic will be unique in the sense that every man on the program will either be present or be represented by his associate.

DON M. GALLIE,
Chairman General Clinic.

GOVERNMENT STENOGRAPHERS

The United States Government is in urgent need of thousands of typewriter operators and stenographers. Women especially, are urged

to apply. Salary, \$1,000 to \$1,200 a year, with chance for rapid advancement. Applicants must be over 18 years of age.

Full information and application blanks may be obtained from the U. S. Civil Service Commission, Washington, D. C., or the Secretary of the U. S. Civil Service Board of Examiners at Boston, Mass.; New York, Philadelphia, Atlanta, Cincinnati, Chicago, St. Paul, St. Louis, New Orleans, Seattle, San Francisco, Honolulu, Hawaii, or San Juan, Porto Rico.

THE AMERICAN SOCIETY OF ORTHODONTISTS

The eighteenth annual meeting of The American Society of Orthodontists will be held August 1, 2 and 3, at the Edgewater Beach Hotel, Chicago, Ill.

This will be an excellent meeting.

It is advisable to make your reservations early.

AMERICAN MEDICAL ASSOCIATION

Program for the Section on Stomatology of the American Medical Association, June 11-14, 1918:

- Chairman's Address. Dr. Frederick B. Noyes, Chicago.
1. Chancre of the Lip Following Injury with Dentist's Emery Disk. Dr. Adelbert M. Moody, Chicago.
 2. An Analysis of Two Hundred Cases of Malignant Diseases in the Oral Cavity by Electro-Thermic Methods, or in Combination with Operative Surgery, X-rays or Radium. Dr. William L. Clark, Philadelphia, Pa.
 3. Treatment of Epithelioma of the Jaws and Cheek, with Heat and Radium. Dr. Gordon B. New, Rochester, Minn.
Discussion Opened by Dr. Albert T. Ochsner, Chicago, Ill.
 4. The Lipoids of Tumors of the Dental System. Dr. Kaethe W. Dewey, Chicago, Ill.
 5. The Genesis of the Epithelial Debris in the Peridental Membrane, Nasmyth's Membrane and the Granular Layer of Tomes. Dr. Eugene S. Talbot, Chicago, Ill.
 6. Additional Roentgenographic Studies of Infections of the Maxillary Bones. Dr. Arthur D. Black, Chicago, Ill.
 7. Microscopic Studies of Diseased Peridental Tissues, Illustrated by Stereopticon. Dr. Edward H. Hatton, Chicago, Ill.
 8. Absorption of the Roots of Teeth. Dr. Herbert A. Potts, Chicago, Ill.
 9. Neuralgia Dentalis. Dr. Kurt H. Thoma, Boston, Mass.
 10. Longitudinal and Transverse Sectional Views of the Accessory Sinuses of the Human Cranium, Cut Parallel and at Right Angles to the Nasal Septum. Dr. Geo. Edward Fell, Chicago, Ill.
 11. Fractures of the Bones of the Face, with Complications. Dr. Vida Latham, Chicago, Ill.
 12. Fractures and Dislocations of the Jaws. Dr. Chalmers J. Lyons, Ann Arbor, Mich.
 13. A New Surgical Procedure for Operating in Cases of Suppurative Gingivitis with Alveolar Involvement. Dr. Arthur Zentler, New York City, N. Y.

The officers of the section cordially invite those who are interested in the program to be present and take part in the discussions.

Dr. FREDERICK B. NOYES, *Chairman*.

Dr. EUGENE S. TALBOT, *Secretary*.

SUBJECT INDEX FOR JUNE 1918

Abbreviations: abs., abstract; disc., discussion; rev., review; edt., editorial; ed., edition.

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I

Human Skull, incrustated with mosaic, representing Tezcatlipoca (the Mexican Jupiter).
Thomas A. Joyce. Mexican Archeology. New York and London, 1914. *Frontispiece.*

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No. 3

MUTILATIONS AND DECORATIONS OF TEETH AMONG THE INDIANS OF NORTH, CENTRAL AND SOUTH AMERICA*

By BENE VAN RIPPEN, D.M.D.

NORTH AMERICA

THE wounding, maiming and disfigurement of the body is almost a general practice among savages and is pursued by many entire races. There are many varieties and just as many localities where these practices occur. Nearly every part of the human body is the object and nearly every motive common to us all, vanity, affection, prudence, religion and trial of endurance, has prompted these customs of great antiquity.

The freedom with which the different aborigines alter the appearance and the different parts of the human body is very interesting, and has for many years attracted considerable attention. Deniker classed these various practices as "Ethnic mutilations," which is a very appropriate name. The modes of procedure and sufferings endured gives this study more than a per-

* See "Practices and Customs of the African Natives Involving Dental Procedures," this JOURNAL, XIII, 1918, 1, p. 1.

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sonal fascination and interest. Of great interest and value of these "Ethnic mutilations" are their sociological and ethnological relationships, which may yet become one of the means by which cultural links may be established between various tribes and peoples.

Several of the practices described may not have any particular value, but have been included in order to make the record as complete as possible.

The general consensus of opinion seems to be, among those who are qualified to speak on the subject, that dental practices as such were not in vogue among the North American Indians, either at the present or at any time in the past.

Hrdlička (1), a physical anthropologist of great repute, in a communication to the writer says: "A presumptuous and ignorant young fellow who was anxious to become a member of the Academy published a description of an Otomi skull which besides many other errors included a statement that one of the molar teeth in the skull showed an example of aboriginal dentistry in the form of an artificial filling of a cavity. I was asked to examine the same skull and found that the 'filling' was merely some dried mud. As a result, the young man was for a time referred to among his friends as 'la muela Tapada,' and lost his chance of getting into the Academy." Commenting upon the general situation, he continues: "To my knowledge there were never among the Indians any regular or reputed 'tooth pullers,' though possibly some individuals may have been known on occasions for such a proficiency. Since the introduction of modern dental forceps I have seen an Indian using such forceps on various persons, but he had no ambition to make the tooth-pulling his vocation."

And again, in another writing, says: "The Indian Crania from all periods and all parts of the Continent show that 'extraction' or knocking out of teeth was relatively uncommon."

Wissler (2) shares the opinion of Hrdlicka and says: "I

1. **Dr. A. Hrdlicka:** Curator Anthropological Department. Smithsonian Institute, Washington, D. C.
2. **Clark Wissler:** Curator Dep't of Anthropology, American Museum of Nat. Hist., New York.

II

Serrated filing in a Tarascan Skull.
Carl Lumholz. Unknown Mexico. Vol. II, p. 427. New York, 1914.

III

Zacapa skull (left $\frac{3}{4}$ view) showing double serrated filings in the central and single filings in the lateral incisors as well as in the left cuspid. No filing can be observed in the right cuspid, no doubt due to the reduction of the crown. The other Zacapa skulls show no cuspid mutilations.
By courtesy of the Anthropological Department of the American Museum of Natural History, New York. Cat. 99.132.

think it safe to say that mutilation of the teeth, if ever practised among the North American Indians, was rare. However, we have in our collection three skulls from Zacapo, Mexico, in which the upper lateral incisors have a narrow groove about 2 mm. wide at the base and 3 or 4 mm. deep, filed across the cutting edge. But we also have other skulls from the same region in which this does not occur." See illustrations.

Parker (3), in a communication to the writer, also agreed that "as far as I know there was no general practice of teeth mutilations in North America, north of Mexico, though there may have been occasional instances due to individual fancy. In my excavations I have never found an artificially mutilated tooth."

Von Thering (4), who I believe was the first in describing teeth mutilation collectively, and speaking about these customs in America, says: "As a whole we may say that these mutilations are not a general custom, and are found only in isolated cases."

However, in a number of instances dental procedures and mutilations have been recorded and collected, and, although isolated occurrences, they may prove to be of special interest for that very reason.

The various customs relating to this subject are of interest to the dental profession on account of the technic involved, and because of pain suffered without complaint and the results obtained both technical and cosmetic.

Therapeutics, among the Indians, was very crude and little practised, due no doubt to their Shamanistic tendencies.

Lasch (5) in his article on tooth mutilations in America, speaking of the Eskimos, says: "Tooth-filing also occurred among them, a case being described of a woman of the Mackenzie River district. This woman filed away the rough edges of the teeth, caused by the fracture of parts of the crown. This is due

3. **Arthur C. Parker:** State Archeologist, N. Y. State Museum.

4. **H. von Thering:** *Zeitschrift für Ethnologie*. Berlin, 1882. Vol. XIV, page 260.

5. **D. Richard Lasch:** *Die Verstümmelung der Zähne in Amerika. Mittheilungen der Anthr. Gesellschaft. Wien*, page 13.

to the severe usage they make of their teeth, being employed as pinchers for untying knots, shaping booth soles, stitching skins, etc." Hayes (6), speaking of the Eskimos, remarks about "their teeth having been worn down almost to the gum from the nature of their food and from their practice of preparing hides by chewing."

Petitot (7) relates that the "Eskimos of the Mackenzie River cut down the crown of the upper incisors so as not to resemble dogs." This account is entirely different from the one by Lasch. The former is a corrective measure, as it were, a procedure aiming to affect an improvement in the condition of the teeth. The latter, however, relates to a custom or superstition, similar to those found among the Myoro in Africa, the Subuna of Mindanao, Malays of Central Sumatra and some of the Borneo Dyaks.

Vancouver (8), the prominent explorer, visited the Modocs^a on the Pacific Coast and states that "all the teeth of both men and women were by some process ground uniformly down horizontally to the gums, the women especially carrying the fashion to an extreme had their teeth reduced below the level." The Chinooks (State of Washington) are mentioned by Bancroft (9) for the same reason, but with the explicit information that it was due to food containing sand, particularly salmon, which during the drying process was blown over with sand.

Catlin (10) mentions toothpulling, but says nothing about its origin or its significance.

A distinct case of mutilation is quoted by Saville (11), of

^a The Modocs, Klamath River, No. California.

6. D. Hayes: *Historical Magazine*, Vol. I, page 6.
7. Abbé Petitot: *Bulletin of Society for Anthropology*, 1880.
8. George Vancouver: *A Voyage of Discovery to the Northern Pacific Ocean and Around the World*. London, 1798. Vol. II, page 247.
9. H. H. Bancroft: *The Native Races of the Pacific States*. New York, 1875. Vol. I, pages 163-225-255.
10. George Catlin: *Letters and Notes on the Manners and Customs of the North American Indians*. New York, 1841.
11. Marshall H. Saville: *Pre-Columbian Decoration of the Teeth in Ecuador*. *American Anthropologist*, Vol. XV, page 378.

V

Zacapa skull showing left lateral incisor with a single serrated filing.
By courtesy of the Anthropological Department of the American Museum of Natural
History, New York. Cat. 99-157.

VI

Zacapa skull, right ¹/₂ view, showing serrated filings in both lateral incisors, with a possible remnant of a filing in the right cuspid.
By courtesy of the Anthropological Department of the American Museum of Natural History, New York. Cat. 99-129.

which he took a photograph, adding: "This skull was found by Dr. Fewkes at Sikyatki, Arizona, a study of which seems to me clearly to indicate single serrations in at least three of the upper incisors and in the lower right lateral incisors."

Gravier (12), the French explorer, mentions the Natchez women "having black teeth, which are considered beautiful among them. They blacken them by chewing the ashes of tobacco leaves mixed with wood ashes and rubbing them with these every morning."

No other traveller or investigator appears to have recorded it, but all do agree to the excessive fondness of color by these women.

There may be some more cases recorded or some more specimens in the various collections showing these mutilations, but this does not alter the conclusion that these instances are rare and that it is not a general custom among the North American Indians north of the Rio Grande.

There are, however, several Indian tribes who had a certain line of treatment in case of toothache, and Lasch (13), speaking about the Masceleros of Arizona, says, "when having toothache, insert, after burning a certain kind of twig, as hot as possible into the cavity of the tooth. If the tooth has no cavity, they apply the heated point to the top. This is repeated until the aching ceases. A patient who underwent this treatment, and was helped by it, said it was not very painful. In the case of a small cavity it is known that a small heated wire was inserted. They do not extract the teeth unless they are loose. In that case a sinew or string is used, some friend pulling the tooth out. Another case is told of a man who tied one end of the string to a loose tooth in the lower jaw and the other end to a branch of a tree and then sat down quickly, the tooth being jerked out."

The reasons why we do not find tooth mutilations, and for that matter mutilations in general, to such an extent as among other savage peoples, may be due to their conception of the differ-

12. **Gravier:** Quoted by John R. Swanton. *Main Tribes of the Lower Mississippi Valley*. Bureau American Ethno., page 54.

13. **D. Richard Lasch:** *Die Verstümmelung der Zähne in Amerika*. *Anthr. Gesellschaft Wien.*, page 13.

ent spirits, who to them are personal, spiritual and life-giving powers, and are a product of the intense and integral part of the Indian's nature. Besides their "Great Holy Mystery" the Indians recognize "lesser" spiritual beings, but these owe all their power to the supreme one.

Catlin (14) comments on this as follows: "The Indians do not use the word medicine, however, but in each tribe they have a word of their own construction synonymous with mystery or mysteryman. Broadly speaking then, the healing powers are not primarily what we understand by medicine, but through divine power the healing act of cure is usually accomplished by song, ceremony and prayer."

It is a well-known fact that every Indian carries his own "medicine bag," which he never opens in his life, but wears it only to keep away troubles and disease. For this bag he has the highest reverence, clamping his faith and staking his very life, believing that his "medicine" is the mighty unseen power ruling his welfare and destinies. The result of this faith is that magic, prayers, songs, exhortations, suggestion, extortion and festivities, which may be called hocus pocus, were practised in order, through what they conceived to be divine power, to obtain a cure or relief for their ailments.

The Indians (15) had, however, some specific remedies and procedures which were proprietary, generally among a few old women in the tribe. "In every Indian tribe there were, and in some tribes still are, a number of men, and perhaps a number of women, who were regarded as the possessors of supernatural powers that enabled them to recognize, antagonize or cure disease; and there were others who were better acquainted with actual remedies than the average. They were often-times distinguished in designation and differed in influence over the people as well as in responsibilities. Among the Dakota one was called 'Wakam witshaska,' mystery man, the other 'pejihute witshaska,' grassroot man. Among the Navaho one is 'khatthali,' singer, chanter, the other 'ezeelini,' maker of medicine; among

14. **George Catlin:** *Letters and Notes on the Manners and Customs of the North Am. Indians.* New York, 1841.

15. *Handbook of the American Indians*, Washington. Bulletin 30. Part I.

the Apache one is 'taiyin,' wonderful, the other simply 'ize,' medicine."

MacLean (16), describing the "medicine men," makes the following statement: "The lower resorting to the use of drugs and the higher relying upon the supernatural powers. Shrewd and intelligent, they are revered by the occupants of the lodges, and become instructors of the youth and the guardians of the sacred legends. Occasionally 'medicine' women are found, generally aged persons, who become famous through their numerous cures. 'Medicine' has a twofold meaning, the one referring to the charms and incantations, the supernatural work of the work; and the other the use of physic, the natural part."

From this we observe that the person with the so-called spiritual powers was superior to the one using herbs, etc., a state of affairs similar to the one found through Africa. This is principally due to the fact that the former is doctor and priest (17) combined, and is able to sway his fellow members of the tribe by acts not comprehended and beyond the mental realm of the ordinary Indian.

The general conclusion may be that, as a result of the above mentioned beliefs and practices, the dental procedures as compared with natives of other countries are comparatively small and insignificant, and the healing art, even in its crudest forms, had not attained the height to which, for instance, some of the Bantus tribes of Africa have arrived.

CENTRAL AMERICA

The subject of mutilation and decoration of the teeth by the Mayas and people of Ecuador has been discussed by Saville (18) and by the writer in previous papers (19), and to avoid repetition the reader is referred to the above for further information. It is necessary, however, to bear in mind the mode

16. John McLean: *The Indians—Their Manners and Customs*. Page 95.
17. George Catlin: *The North American Indians*. London, 1876.
18. Marshall H. Saville: *Pre-Columbian Decorations of Teeth*. American Anthropologist. Vol. XV.
19. Bene van Rippen: *Pre-Columbian Operative Dentistry of the Indians of Middle and South America*. Dental Cosmos. Philadelphia. Sept., 1917.

of mutilation by filing and the inlaying custom in order that we may come to an analysis, after considering the various customs throughout the Americas. Particularly the distribution of the various customs may prove to be of great importance in the establishment of cultural links between the various peoples.

Some investigators have contended that the mutilation of the teeth by filing was a custom adopted from the African negro slaves. This may be true in several instances, but this contention is not tenable when it is applied to these methods in general, as found on this side of the Atlantic in Pre-Columbian times.

Leon (20), speaking of the Tarascan^b Indians, says "they have voluntary mutilations as shown by a cranium in the San Luis á Jacona College in which the incisors and pre-molars both superior and inferior show a longitudinal groove resembling a swallow-tail. It is this mutilation of which Bishop Landa speaks he found among the Mayas."

Joyce (21) also mentions the filing and inlaying by the Tarascans, but does not go into details as to the form of the mutilation. He does add, however, that it is of Maya (22) origin.

Lumholtz (23), while digging in the ruins of the palaces of King Caltzontzin, found more than a hundred skulls, most of them Tarascans. "On a few of the Tarasco skulls the teeth were filed, incisions that made them look like swallowtails having been made in the front teeth." The type of filing referred to here is probably the serrate or incisal triangle filing, the same as that found among the Sayata and the Mayas.

Pinart (24) quotes the mutilation of the canines in young girls of the Guaymie^c Indians and also those of the Isthmus in general. It was noticed that the left superior canine was missing

^b Tarascans, State of Michoacan, west of the Valley of Mexico.

^c Guaymas, coast of the Gulf of California, Mexico.

20. Nicholas Leon: *Anthropologie*. Paris, 1891. Vol. II, page 66.

21. Thomas A. Joyce: *Mexican Archeology*. Page 51. New York-London, 1914.

22. Ibid: Page 367.

23. Carl Lumholtz: *Unknown Mexico*. Vol. II, page 427. New York, 1902.

24. M. Alph. L. Pinart: *L. Anthropologie*. Paris, 1891. Vol. II, p. 511.

in young girls. At the time of the first menstruation this tooth is broken to show that she has reached marriageable age.

Pontelli (25), referring to the Lacandones^d in Central America, thought that the human teeth might have had an importance attached to them which was probably a remnant of the scalping custom as a proof of the valor of the warrior. He says "the new chief is inserted with lion skins and a collar of human teeth to represent his victories."

Bancroft (26), deriving his information from Sahagun, speaks of the medical art of the Nahuas in Mexico and among many cases says that a "certain animal tapaiaxin was eaten for a swollen face," and in continuing (27) to describe the various cures mentions "a certain insect was pounded and hot pepper were among the remedies for toothache, and a great care of the teeth was recommended." Another specific for dental ailments was "certain horny skinned worms, similarly powdered and mixed, were a specific for the gout, decayed teeth, and divers other ailments."

I suppose many more "cures" were known, each particular tribe having its own prescription, to which were added superstitious ceremonies, probably the most important element in effecting a cure. These were held to be indispensable. Evil beings and things had to be exorcized, the gods must be invoked, especially the patron deity, known chiefly by the name of Teteionan, who was esteemed the inventor of many valuable remedies.

The Aztec women of rank filed their teeth (28) and painted them red, "which custom they seem to have borrowed from the Huastecs, but tooth mutilation as a whole does not seem to have been a characteristic of the Nahua speaking peoples."

Sahagun informs us also that the Aztecs "after cleaning their teeth painted them with cochineal," which statement may be verified by quoting Gama (29), who informs us that Tlaloc,

^d Lacandons, upper Usumacinta, Northern Guatemala.

25. Pontelli: *California Farmer*. Nov. 7, 1862.

26. H. H. Bancroft: *The Native Races of the Pacific States*. New York, 1875. Vol. II, page 599.

27. Ibid: Page 600, Vol. II.

28. T. A. Joyce: Page 151.

29. H. H. Bancroft: Vol. III, page 325.

the god of water, in the temple of Mexico, "shows three grinders painted red," to which he adds (30) that "when teeth are present in Mexican sculptures always represent Tlaloc."

The Aztec customs do not have the importance those of the Mayas have; the former are later and after conquering the Mayas probably adopted some of their customs.

The Huastecs mutilated their teeth in some instances, as told by Waitz (31), who informed us that they "had their teeth cut in the form of a saw." He is supported by Joyce (32) in the assertion that they not only filed their teeth but "also blackened them." The Zapotecs, as told by Bancroft (33), "in some cases filed their teeth."

"The Otomi women stained their teeth black, while the Mixtecs (34) filed their teeth—a custom adopted from the Huastecs."

The Mayas were known to practise tooth filing, which was also practised by the Yucatec (35) by rubbing with a stone dipped in water. About this we are also informed by de Landa (36) in his description of the people of Yucatan remarking in the following manner: "The practice of filing teeth prevailed to a certain extent among the women of Yucatan, whose ideal of dental charms rendered a saw teeth arrangement desirable. The operation was performed by certain old women, professors of the art, by means of sharp gritty stones and water."

That some of these mutilations are in vogue in Costa Rica is told by Skinner in a private communication to the writer, informing him that the "Bri Bri Indians of the Talamanca Mountains sometimes file their front teeth to a sharp point." This is a custom in vogue to the present day, but no reference is made as to its origin or purpose.

30. H. H. Bancroft: Vol. III, page 398.

31. Th. Waitz: *Anthropologie der Naturvölker*. Leipzig, 1859, page 54.

32. Thomas A. Joyce: Page 151.

33. H. H. Bancroft: Page 651.

34. T. A. Joyce: Page 151.

35. Ibid: Page 295.

36. Diego de Landa: *Relacion des Choses de Yucatan*. 1566. Texte Espagnol et Production Francaise par M. Brasseur de Bourbourg. Paris, 1864.

All the peoples mentioned here are either of Maya stock, such as Huastecs, or they are preceded by the Mayas, which must be borne in mind in order to trace the origin of these various customs.

The Mayas were known to practise toothfiling and inlaying (37) and were the first on record in Central America. They had the step filing, but also the single and double triangle filing. The writer believes that the filing custom preceded the inlay method.

These mutilations may also be seen reproduced in their pottery figurines, in which the teeth are often filed to a point, or even mutilated in the characteristic Maya fashion. (38) They may also be seen in the shields carved upon the monuments (39), some of which bear as a device the face of the sun, distinguished by the peculiar form of the teeth. This is very well shown in the Temple of the Sun at Palenque. A fine specimen of Maya pottery, judging from the peculiarly cut teeth, may be identified with the Sun God. The mode of cutting in this case is similar to the skull inlaid with mosaic reproduced in this article.

In considering the different peoples and tribes practising mutilations, one has to be careful in consideration of the influence of the negro slaves, who were known to file their teeth to a point, which custom was no doubt adopted by some of the Indian tribes.

SOUTH AMERICA

In the Southern hemisphere we find these ethnic mutilations, not only more numerous than in North America, but we also meet with a greater variety. It is found in almost every one of the countries there, but not with all the tribes or peoples of one particular country. This is not strange when one considers other customs which have been in practice by one tribe since remote times, but were never acquired by the neighboring peoples.

ECUADOR

The use of gold in beautifying the teeth and thereby en-

37. See article by Marshall Saville: *American Anthropologist*. Vol. XV, and by the writer in *Dental Cosmos*. September, 1917.

38. T. A. Joyce: Page 195.

39. Ibid: Page 344.

deavoring to obtain a more pleasing appearance was a custom primarily found in Esmeraldas, Ecuador. Although of great interest, the writer does not believe that these mutilations are of so great an importance as the simple filings, they are no doubt a later development of the simpler art, coming into vogue after the art of melting and moulding gold was mastered.

Skulls with teeth inlaid with gold have been found in Atacames, Esmeraldas. Cieza de Leon travelled along the coast of Ecuador about 1545 and noticed the use of gold for inlays, proving that this custom still persisted after the arrival of Pizarro in 1527.

The use of gold disks instead of inlays was a custom adopted after inlays had already been in use, which may be proved (40) by a skull found in La Predra, Esmeraldas, and also by a tooth (41) showing a gold disk inserted, previous to which the tooth had been filed with two serrations.

The operative procedures involved in the disk method are more complicated than in the case of circular inlays requiring finer implements and technic.

Two gold disks, probably used for inlays, were found in Tomsupa (42) and numerous disks were found in La Tolita, a hundred miles to the north of Atacames, but in all the extensive diggings no skulls with decorations have been found.

An entirely different type of gold decoration (43) was found at Tonchigue, a few miles south of Atacames. It consists of a gold disk elongated at one end and a round disk at the other end. The latter was bent around the tooth, exposing the round part in front. In this way an imitation of the gold inlay disk was obtained. This mode of ornamentation seems to be a later development as judged by the reasons which may have prompted the making of it; first, no cavity preparation; second, no pain.

40. **Bene van Rippen:** *Pre-Columbian Operative Dentistry of the Indians of Middle and So. America.* Dental Cosmos. Philadelphia, Sept., 1917.

41. **Marshall H. Saville:** *Pre-Columbian Decoration of Teeth.* American Anthropologist. Plate XIX. Fig. F.

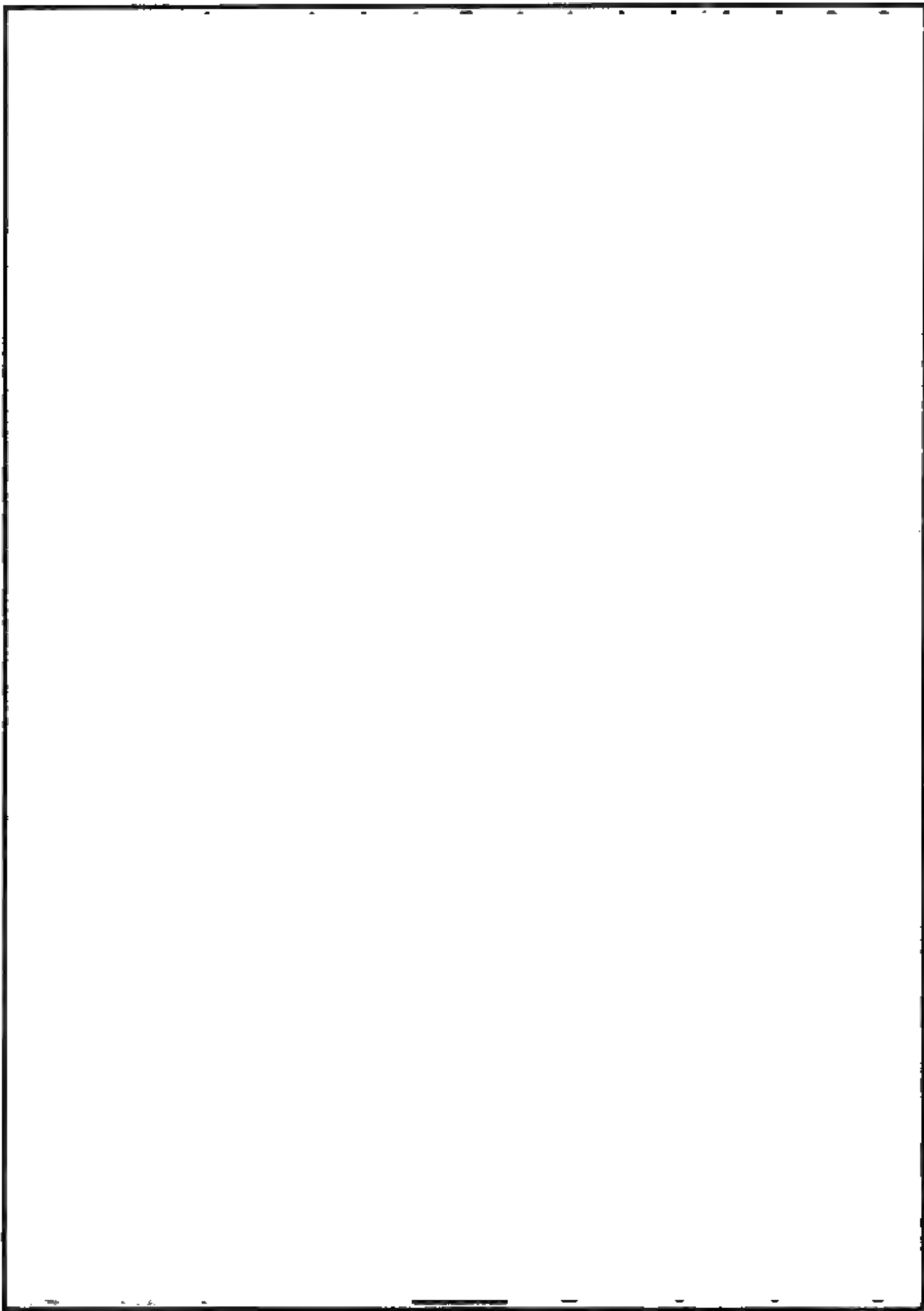
42. *Ibid:* Page 384.

43. *Ibid:* Page 386.

44. *Ibid:* Page 380.

VII

Skull from Tocarji, Potosi province, Southern Bolivia. Showing filed inferior incisors.
Reproduced from A. Chervin, Tome III, Plate 81. No. 285.



VIII

Skull found at Sayata, Northern Argentine. Showing the rectangular mutilation.
Reproduced from A. Chervin, *Anthropologie Bolivienne*. Paris, 1908. Tome III,
fig. 26.

The writer believes^e that the four methods of teeth mutilation described were practised in the following order:

First—incisal filings; *second*—circular cavity preparation for inlay; *third*—square cavity preparation for gold disks; *fourth*—gold ornaments without mutilation of the teeth. These adaptations are of interest, however, as it shows the ingenuity of this people to overcome their difficulties.

That extractions were practised may be proven by quoting Benzoni (45), when visiting Guayaquil, who says: "These people sometimes draw five or six of their upper teeth, and when asked the reason for so doing they answered that 'it is for beauty's sake.'"

Cieza de Leon mentions also that some of the chiefs of Equador fasten some small bits of gold to their teeth, which is an interesting statement when it is known that gold was also used for this purpose near Atacames in Esmeraldas.

Saville mentions the filing of the teeth to a point in Manabi and that special iron files are used for the purpose. Having no statements from the early writers on this subject, and never finding any skulls showing pointed teeth, this investigator thinks this custom to be of negro origin, and not a survival of the early Central American practices.

PERU

It is very interesting to find de la Vega (46) speaking of a custom prevailing in Peru, who says that: "Tooth knocking out was practised by the ancient Peruvians who regarded it as a punishment ordained on their ancestors, and binding upon themselves, or as a service rendered to the divinity." This is rather a hazy description, but it primarily shows that the knocking out had not only a religious motive, but also one associated with

^e The skull found on the Esmeraldas Coast and mounted by Bollaert (44), having artificial teeth secured to the cheek bone by a wire of gold, and the skull, found in a garden jar, showing interlacings of gold wire around the teeth, are not considered by the writer to be a pure native custom.

45. Girol Benzoni: *History of the New World*. 1565. Page 244. Translated by W. H. Smyth. London, 1857. (Hakluyt Society.)
46. Garcilasso de la Vega: *Historia General*, Vol. IV, page 3. Madrid, 1730.

tribal custom or superstition. That mutilation by extraction was practised by the Peruvians is substantiated by Zarate Gaicilasso and Paw, who say: "Mutilation by extraction must have been used from time immemorial in Peru, where it must have been used as a mark of infamy among the rebellious and conquered tribes." This statement is in part analogous to the one made by de la Vega, but it is not very conclusive, as no proof or authority is given—"it must have been used," etc.

Von Thering (47) mentions that "a Peruvian mummy has been found having filed incisors, which seems to have been performed during childhood." (48)

Von Tschudi (49) also mentions some Peruvian Indians having the custom of filing the superior incisors to a point, which custom he says is also found among some negroes. Von Thering mentions an Aymara skull which shows "all superior incisors and one inferior incisor filed." And again "Skyring tells about the Patagonians filing their incisors to a point." The latter are a people who roamed the coast as far north as the Rio Negro region, Peru, a fact worth remembering in drawing a tenable conclusion as to the origin of the custom.

It seems beyond doubt that mutilation by extraction and filing were practised in Peru, but the motives for it are rather obscure and indefinite.

Davis (50) mentions the "people of Guancavilcas,"[†] saying: "They used to pull out their teeth in each jaw, the fathers doing it to their children when of very tender age, what they thought was no evil, but rather a service very acceptable to their gods."

[†] Reference is made here probably to Huancavelica in Northern Peru, south of the city of Callao.

48. Marshall H. Saville: *Pre-Columbian Decoration of Teeth*. American Anthropologist. Vol. XV, page 379. Says that: "To our knowledge, among the thousands of mummies and skulls from Peru, inlaid or filed teeth have never been found, and it is a fact of very great significance in the study of migrations of the ancient people of the west coast of Central America, and of northwestern South America."

Apparently Saville has not accepted von Thering's statement that a mummy had been found with filed teeth.

47. H. von Thering: *Zeitschrift für Ethnologie*. Berlin, 1882. Band XIV, page 260.

49. J. J. von Tschudi: *Reisen durch Südamerika*. Leipzig, 1869. Band V, page 402.

50. John B. Davis: *Thesaurus Craniorum*. London, 1867.

P. de Leon (51) mentions the same as early as 1532, from which source Davis probably derived his information. The former, however, adds another reason, and continuing says, "that Huayna Capac came in person to conquer them, and that, having been disobedient in some particulars, he made a law that they and their descendants should have three of their front teeth pulled out in both jaws."

Chervin (52), who explored western Bolivia and a part of Peru, found among the skulls from Tocarji, valley of the Paragua River, Bolivia, teeth mutilations of the serrate shape. The writer calls this the "incisal triangle" filing, showing in this case but one triangle, the apex of which is pointed towards the root. This is but a variation of the one found in the Sayata skull, which may have its importance, as it shows the geographical distribution of the filing custom.

ARGENTINE

Filed teeth have been found in the northwestern part of the Argentine Republic, as shown by the skull found at Sayata. Chervin (53) in describing these mutilations says that this was the only skull having these, found among about five hundred examined in the Sayata region. The mutilation has a rectangular shape. A part of the crown of the left lateral incisor is absent, but the two cuts showing the procedure carried out can be clearly seen. Apparently, as judged by the evidence, a groove was made on each side of the pulp chamber, after which the central portion was knocked out from the tooth.

This skull is of particular interest on account of the two large circular foraminae in the mandibula. Chervin speaks of them, but Boman (54) does not mention them at all. The former

51. **P. de Leon:** *Travels in 1532-1550*. Translated by R. Markham. London, 1864. Chapter 49.
52. **A. Chervin:** *Anthropologie Bolivienne*. Paris, 1908. Tome III, pages 93-98. Plate 81. Fig. 285. Plate 86. Fig. 314.
53. **A. Chervin:** *Anthropologie Bolivienne*. Paris, 1908. Tome III. Page 58.
54. **Eric Boman:** *Antiquities de la Region Andine de la Republique Argentina et au Desert d'Atacama*. Paris, 1908. Tome II. Pages 579-583.

attributes them to the breaking away of the outer wall at that point being due to the frailness of the osseous structure, exposing the permanent inferior incisors. Upon examination of the reproduction of the skull by Boman, one can easily see that these foraminae are artificial, as indicated by the edges being round and clear cut. The question now presents itself whether these foraminae were made for the purpose of ascertaining the presence of permanent teeth in order to establish the age of the subject, something wholly unnecessary. The age of any skull of that period may be easily judged by the temporary elements present. If not for that reason, they must have been made post mortem or directly preceding the death of the subject, which may throw another light upon the motives for the dental mutilations. But if these foraminae are post mortem, then the dental mutilations may have been performed at that time, a fact which can be easily learned by examination of the teeth involved. If this were true, it would prove that dental mutilation was not practised upon the living subject and neither was it a custom among these people.

BRAZIL

We also find these mutilations in different parts of Brazil. Von Thering (55) says: "It is a well-known fact that the Indians from Pernambuco had their teeth filed to a point; and when one sees an Indian with pointed teeth, he is known to be from that place. There is no doubt that the custom dates back to the importation of slaves who were accustomed to this habit."

Schmidt (56) relates that the Guato Indians practised extraction and has a sketch showing a "Rachenstachel" * "with which the gum was lacerated to procure a clearer field of operation." The Guatos are of the Chaco stock and are found in the

* This writer does not mention anything regarding this implement. It may be translated as "jaw prong," or "prong made from a jaw."

55. H. von Thering: *Zeitschrift für Ethnologie*. Berlin, 1882. Band XIV. Page 215.

56. Max Schmidt: *Indianen Studien in Zentral Brasilien*. Berlin, 1905. Page 297.

upper Paraguay, but by some are thought to be of a Northeastern origin.

Krause (57) describing the different tribes he encountered on his journey into interior Brazil, mentions the Karaja Indians, saying: "They do not practise extraction or any form of dental mutilation, but do use a bark called 'partudo' and a fruit by the name of 'libure.' They treat aching teeth with either or both but allow the teeth to remain until they fall out."

Boggiani (58) mentions the "Mbayas of Paraguay who practise filing of the teeth. They only mutilate the upper four incisors and file them so as to give them a triangular pointed appearance, and this is done for decoration only." The Mbayas are also of the Chaco Stock judged by the linguistic relationship, as are the Guatos, and live on the Rio Xerui, Western Paraguay.

Martius (59) states that "the Muanha of the Amazon River district are accustomed to point their superior cuspids," and Ploss (60) as early as 1800 speaks of the "Ubung" of South America who practise "knocking out teeth, more as a trial of the youth's pride and strength than for reasons of beauty."

Wiffin (61) makes mention of the "Okaina along the Amazon River," who are cannibals, "wearing necklaces of human and jaguar teeth, some of which are carved, but all done after extraction from the dead individual who has to be a slain enemy." These people have no regular dental operations.

Waitz (62) comments on the Chaymas Guiana who "blacken their teeth and so do the Guayros^a from R. de la Hacha and the inhabitants of Cumanoi in olden times."

^a The Guayros here spoken of are probably the Guayos from the River Marañon, the upper part of the Amazon. Reference is made here apparently to the Cumanas or Cumanogatos of the northern coast of Venezuela.

57. **Fritz Krause:** *In den Wildernissen Brasiliens.* Page 337. Leipzig, 1911.

58. **G. Boggiani:** *Viaggi d'un artiste nell America meridionale.* Roma, 1895.

59. **K. F. Martius:** *Beitrage zur Ethnographie Amerika.* Leipsic, 1867, page 536.

60. **H. Ploss:** *Reise um die Welt in dem Jahren, 1800-1804.* Hamburg, 1806.

61. **Thomas Wiffin:** *The Northwest Amazonas.* London, 1914.

62. **Waitz:** *Anthropology.* Vol. III, page 506. 1862.

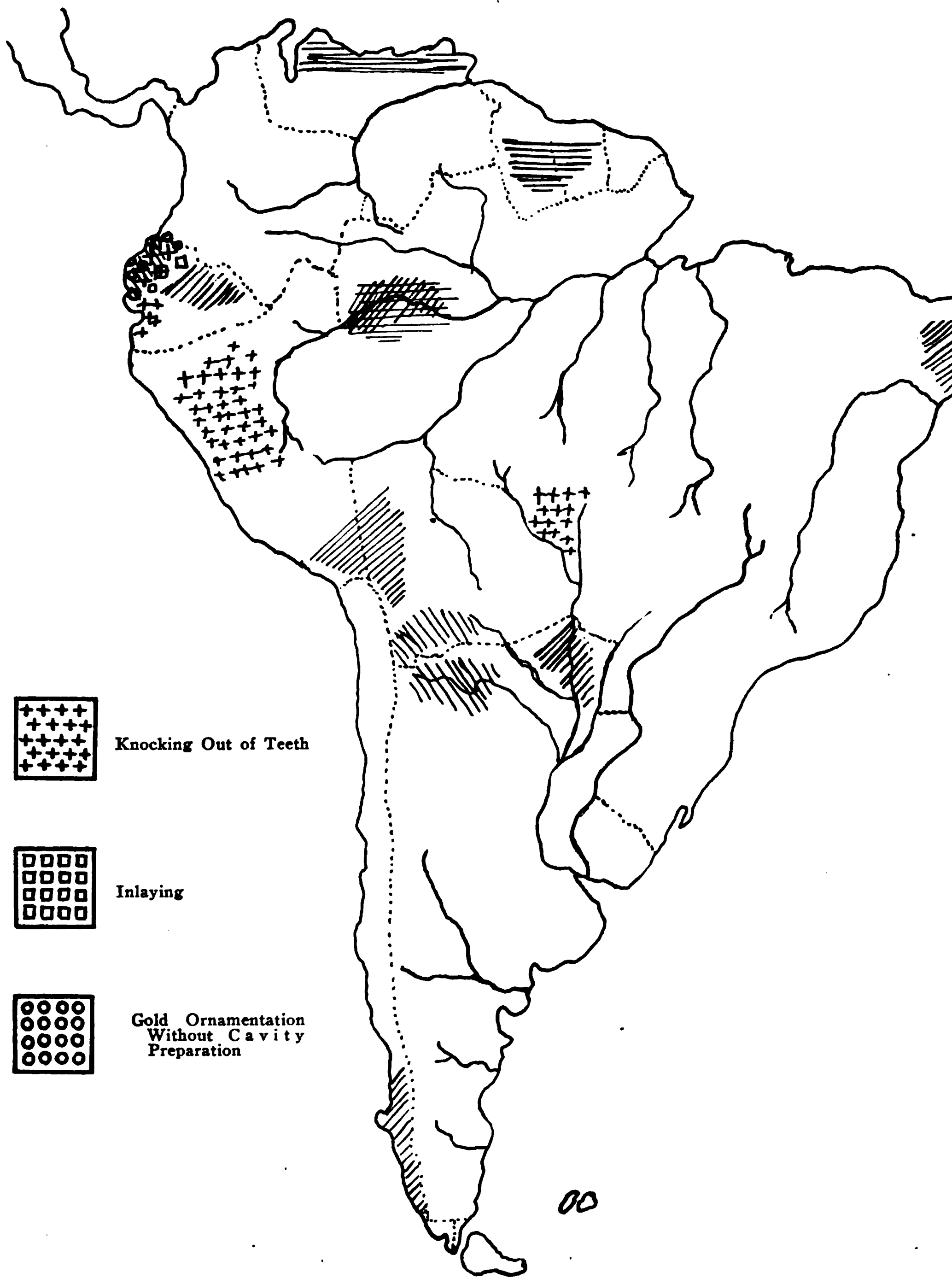
EXHIBIT I

Name of People	Location	Procedures	Reasons for Procedures	Sex	Remarks
Ancient Peruvians	Peru	Knocking out of teeth	Punishment		Sign of a conquered tribe
Indians of today..	Peru	Filing	?	?	
Aymara.....	Southern Peru and Western Bolivia	Filing of sup. incisors and one inferior incisor	?	?	
Aztec.....	Central Mexico	Painted red with cochineal. Step filing	Cosmetic		Adopted from Huastecs?
Bri Bri.....	Costa Rica	Pointed filing	?	?	In vogue today. Origin unknown
Chaymas.....	Guiana.....	Blacken their teeth	Cosmetic	?	
Cumano.....	Northern coast of Venezuela	Blacken their teeth	In olden times		
Eskimo.....	Mackenzie River	Filing. One case of cutting down crown of sup. incisor	Not to resemble dogs	?	
Guato.....	Upper Paraguay River	Extraction	?	?	North-eastern influence (slaves)?
Guayma.....	Coast of Gulf of California, Mexico	Knock off crown from sup. canine	At first menstruation to show marriageable age		Negro origin?
Guayros.....	Upper Amazone	Blacken their teeth	Cosmetic	?	
Huastecs.....	Eastern coast of Tamaulipas, Mexico	Serrated and pointed filing and blackening	Cosmetic	?	
Maya.....	Mexico	Circular crystal inlays; serrated and step filing	Cosmetic	?	
Mbaya.....	Paraguay	Filing to a point	Cosmetic	?	Negro influence?
?	Manabi.....	Pointed filing	?	?	Negro influence?
Mixtec.....	Xoxo, Mexico	Filing	?	?	Adopted from Huastecs?
Muanha.....	Upper Amazone	File to a point	?	?	Negro influence?
Natchez.....	Louisiana	Blacken their teeth	Cosmetic	Female	

MAP I

See following page





MAP I

IX

"Rachenstachel" used to lacerate the gingiva preliminary to extraction.
From Max Schmidt. Indianen Studien in Zentral Brasilien. p. 297.



MAP II.

Distribution of the Archaic Culture. The areas in black show the distribution of figurines of the archaic type; the areas in dots show the probable extension of pottery on the Archaic Horizon.
(After Spinden's Ancient Civilizations of Mexico and Central America.)

EXHIBIT I—Continued

Name of People	Location	Procedures	Reasons for Procedures	Sex	Remarks
Otomi.....	Mexico	Blacken their teeth			
Patagonians.....	Patagonia, S. America	Filing to a point			
?	Sayata, Northern Argentine	Square filing	?	?	Post-mortem ritual?
Tarascan.....	Michoacan, Mexico	Filing; longitudinal groove; serrated filing; inlaying	Cosmetic	?	Skull
?	?	Knocking out teeth	Trial of pride and strength	Youths	Negro influence?
Yucatec	Yucatan	Serrated filing	Cosmetic		
Zapotecs.....	Oajaca, Mexico	Filed their teeth in some cases	Cosmetic?		
?	Zacapo, Mexico	Serrate filing	Cosmetic		
?	Tocarji, Southern Bolivia	Serrate filing	?	?	
?	Esmeraldas, Ecuador	Gold inlays and disks; serrated filing; extraction of 5 or 6 teeth			
?	Pernambuco	Pointed filing	?	?	Negro influence? custom disappearing
?	Guayaquill	Extraction	Cosmetic	?	

EXHIBIT II

	People	Location	Remarks
Pointed Filing	Aymara	Southern Peru and Western Bolivia	
	Muanha	Upper Amazone, Brazil	Negro influence?
	Patagonians	Chili	
	?	Pernambuco	Negro influence; custom is disappearing
	Bri Bri Indians	Costa Rica	Origin of custom unknown
	Huastecs	Mexico	
	Mbaya	Paraguay	Cosmetic
	?	Manabi, Ecuador	Negro influence?

EXHIBIT II—Continued

	People	Location	Remarks
Serrated and Step Filing	Aztec	Mexico	
	Huastecs	Mexico	
	Maya	Mexico	
	Mixtec	Mexico	
	?	Sayata, Northern Argentine	Deformed at age of 7
	Tarascan	Mexico	
	Yucatec	Yucatan	
	Zapotecs	Oajaca, Mexico	
	?	Tocarji, Southern Bolivia	
	?	Esmeraldas, Ecuador	
	?	Sikyatki, Arizona	
Discoloration of Teeth	Aztec	Mexico	Red Coloring
	Chaymas	Guiana	Black Coloring
	Cumano	Northern Coast Venezuela	Black Coloring
	Guyaros	Upper Amazone, Brazil	Black Coloring
	Huastecs	Mexico	Black Coloring
	Natchez	Louisiana	Black Coloring
	Otomi	Mexico	Black Coloring
Knocking out out of Teeth	Ancient Peruvians	Peru	Sign of a conquered tribe; tribe; later adopted generally as a custom
	Guato	Southern Matto Grosso Brazil	Negro influence?
	Guayma	Pacific Coast, Mexico	At first menstruation; sign of marriageable age; negro influence?
	?	?	Trial of strength and pride
	Guyaquill	Ecuador	
	?	Esmeraldas, Ecuador	
Inlaying.....	Maya	Mexico	Mineral substances used
	Tarascan	Mexico	Mineral substances used
	?	Esmeraldas, Ecuador	Gold inlays and disks
	?	Campeche, Mexico	Gold inlays
Gold ornamentation without teeth mutilation	?	Atacames, Ecuador	Gold disk bent around in front of teeth
	?	Esmeraldas Coast	Interlacing, between the teeth of gold wiring

CONCLUSION

After surveying the material presented and bearing in mind the time and place of these various mutilations, one may come to a tenable conclusion as to their origin and the direction of their distribution. No sight must be lost of the fact that, comparatively speaking, little is known today about Equador and Colombia, which in time may prove the deductions to be partly or wholly incorrect. An analysis, however, is made with the desire to arrive at a just and logical conclusion based upon the evidences presented in the previous pages.

The occurrence of filed and decorated teeth is rare, very few specimens having been found, but that is not a proof that the custom was not more common in olden times. Consideration must be given to the fact that few of the skulls retain their teeth; the majority of them being lost during excavation or having disappeared during the long time of burial. The writer examined a few hundred Peruvian skulls and to his astonishment found about 5 per cent. of them having a few incisors; not one skull had a complete set, the remaining were all edentulous. This shows that if a skull is found having mutilated teeth, it may prove that the custom was more common than sometimes is supposed.

The question presenting itself is this: "By whom were these practices first initiated and how did they affect the customs of the neighboring peoples?"

The Mayas had the earliest homogenous and the highest state of culture of any of the American peoples. They preceded not only the Aztecs, Mixtec, Zapatecs Yucatecs and the Tarascans, but also the Incas of Peru.

Joyce (63) believes that the toothfiling¹ and inlay custom was a distinct Maya custom which was taken over by the Huastec, the latter of a Maya-speaking people.

Upon examination of Map I, we may at a glance see where the several customs were found to occur. But particularly will

¹ The pointed filing of the Bri Bri Indians of Costa Rica and of the Mbaya of Paraguay are not considered on account of the questionable origin, which, however, has not been proven to be Negro.

63. T. A. Joyce: *Mexican Archeology*. Page 367. New York, London, 1914.

one be impressed that Southern Mexico and Central America are the places where the several customs occur simultaneously. The single serrated filing in Arizona, present in a skull found at Sikyatki, is probably of southern origin—it being known that the Maya influence reached further north into Montana and Idaho.

The writer believes that the filing and inlaying were either initiated by the Mayas, or are the first on record, after which a distribution to the several areas, indicated on Map I, followed. This conclusion is based on the following evidences:

First: By examination of Map II it is shown that the distribution of the Archaic Culture was north, south and eastward. It is true that this culture precedes the great Maya period, but it is possible that the Mayas at that time practised teeth mutilation. The inlaying dates back to the great period but it must have taken a long time before it had reached the perfection it finally attained.

Second: The distribution of the different filing methods during and after the Mayas is both north and southward. The one case mentioned about filing teeth in a Peruvian mummy is too vague to be accepted at present, but if it could be proven to be the case, it would not interfere with the conclusions—the Megalithic and Inca Empires being later than the Archaic and Maya cultures in Central America.

Third: By examination of Exhibit II the fact is proven that this particular Maya method was found in Arizona, Southern Mexico, Central America, Tocarji, Bolivia, Aymara, Southern Peru and Western Bolivia, and Esmeraldas, Ecuador. All these localities are represented by skulls showing these various methods, dismissing any non-American influence.

Fourth: By examining Exhibit II one may see that all the various teeth mutilations have been recorded in Southern Mexico and Central America, with the exception of the knocking out of teeth. No other territory can claim so many types.

Fifth: That the cultures of Ecuador are remotely connected with those in Peru and Argentina does not contradict the Maya claim. The Megalithic Empire (64) had its beginning about

64. Clements R. Markham: *Incas of Peru*. New York, 1910. Page 41.

200 B. C. which after a long time, about 600 A. D., was invaded apparently by savages from the Southeast and Brazil. This empire, based on archeological evidences, had its northern boundaries south of Quito, Ecuador. The Quitu had their culture about the same time as the Mayas, lasting, however, a few hundred years longer, after which appear the Cara of Inca stock. This precludes southern influence on the Quitu, which in turn might have reached the Mayas. The Mayas already practised their inlaying at that time. This review may lead to the conclusion that Ecuador was influenced from the north rather than from the south, which opinion Saville (65) expressed some years ago. It also may show that the skulls found at Sayata and Tocarji are instances which owe their origin from the northwest. The circular inlaying in Ecuador is similar to that of the Mayas with the exception of the substance used which does not necessarily mean it to be an independent, but rather a varied custom. That the Equadorians were adept in trying new methods is shown in their use of fitting square disks into square preparations and finally using gold without cavity preparation at all.

The pointed filing does not enter into this final consideration, as it would not assist but rather embarrass a logical deduction, except when found in old skulls like those of the Aymara and Manabi.

The Huastecs being a Maya people, would probably adopt some of their customs. The Tarascans, never conquered by the Aztecs, would not so easily practise a custom in vogue among their enemy, which may bring their custom under the Maya influence. The Zapotecs in Oaxaca were greatly indebted to the Mayas for decorative motives (66), as seen by their urns showing a close connection with the Maya art. Their culture was later and lesser, but a distinct one, and they may have adopted the customs from the Mayas or Huastecs.

The discoloration and extraction of teeth are very interesting, but seem all to be of a later date than the filings. The reasons for the latter are different and the origin of the customs is not sufficiently established to warrant at present a fair analysis.

65. Marshall H. Saville: *American Anthropologist*. Vol. XV, page 390.

66. Herbert J. Spinden: *Ancient Civilizations of Mexico and Central America*. Page 141.

A few words may be said about the probable northern origin of the Mayas as based upon their legend, informing them that their ancestors came from a more northern latitude, following down the shore of Mexico. This is supported by the position of the Huastecs (67) who may be regarded as one of the tribes left behind in the general migration and by the tradition of the Nahuas which assigned them a northern origin.

Spinden (68) places no value on the legend of "The Seven Caves," considering it but a story which tries to explain the emergence of their race from the underworld. The Aztecs also have their history of a northern origin, but in all their peregrinations traveled but eighty miles, as based upon archeological evidences.

These views conflict as to the place of origin of the Mayas which prompted the writer to stand aside on this disputed question, but judges the result by the evidences at hand up to the present time.

67. Daniel G. Brinton: *The American Race*. New York, 1891. Page 153.

68. Herbert J. Spinden: *Ancient Civilizations of Mexico and Central America*. New York, 1917. Page 181.

TRINITY HALL,
Cambridge, Massachusetts.

PRESIDENT'S ADDRESS¹

BY FRANK T. TAYLOR, D.M.D.

FELLOW MEMBERS of the *Massachusetts Dental Society*:
It is a pleasure to welcome you to the fifty-fourth annual meeting.

Your President has visited the several district societies, with the exception of the Western, at least once during his term of office.

The first visit outside the Metropolitan district was made in Fitchburg, where the dentists of that region had formed a new society called the Wachusett Valley Society, and were in a receptive mood to hear of the benefits of joining the Massachusetts Dental Society as a new district society. The Central District, whose jurisdiction would be most affected, had already given its formal approval to the plan, and the Chairman of the Executive Committee with your President went to Fitchburg to try to show the benefits of membership with us. The Wachusett Valley Society voted, before the close of the meeting, to apply for membership as a new district. This is the first new district to be formed since the original division of the society into districts.

Other visits were made to the Southeastern District at Fall River, the Central District at Worcester, and the Valley District at Holyoke.

Your President was also selected, probably ex-officio, to be Chairman of the Liberty Loan Committee's section for dentists, for the First and Second Loans. This appointment, though undesired, was not one that could be refused. The Committee's activities were limited to the sending out of circular appeals, of which you all received copies.

The Society has had a very prosperous year, as shown by the large increase of numbers in membership, and its financial condition is of the soundest character.

¹ Read before the 54th Annual Meeting of the Mass. Dental Society, May 1, 1918.

It is natural that as a society becomes larger it grows more attractive to the members of the profession from sheer weight of numbers, as each non-member finds more and more of his acquaintances and friends in the profession who are members and who talk of the meetings, committees or other activities of the society. This form of publicity directed to the doings of the society tends to make the non-member desire the privileges and benefits of membership, and leads to applications to the district societies. This cumulative action has had a certain effect this year, and the effect is bound to be more marked in the future.

Again, the interest excited by the meeting of the National in New York last October was genuine and deep. Many non-members tried to attend but found that the privileges of the meeting and clinics were reserved to members of the State societies. This gave an added value to such membership in the eyes of the applicants so disappointed. A little inquiry leads the non-member to the knowledge that the National Journal is one of the perquisites of the members, and that journal is rapidly improving, so as to give promise of taking its place in the lead of dental journals at no distant date.

Some dentists who wished to enter the service of the United States as Dental Officers found that it was necessary to belong to the recognized dental society of their own State before they could be eligible to examination for commissions. This necessity brought in a few applications to the Society.

Of the more local reasons for the increase in membership, and much the more powerful ones, the activities of the committee on education takes perhaps the first place. As all of you know, this committee has planned and carried out a course of lectures and demonstrations in War dentistry that reflects great credit on the committee members and upon those who so freely gave of their time and energy to the carrying out of the instruction offered.

This committee was originally appointed by the Metropolitan District, and made application to your President for appointment from the State Society as it became evident that its activities could be broader and that more members could be served in the name of the larger body. The membership of the committee was

exclusively from the Metropolitan District and the first thought of the President was that the other districts should also be represented on so important a committee as that on Education. Inquiry showed that the Committee's plans were so far advanced that a reorganization of its membership, and the time and energy required to get together the larger body with the recapitulation of the work already done for the approval of the full committee would delay the work to what seemed a very unnecessary degree. Hence, the committee was appointed from the State Society as it was already constituted, and I am sure that you will agree with me that the selection of its members was a happy one. The thanks of the Society are due to these gentlemen who have done such splendid work. The course of lectures and demonstrations at the Forsyth infirmary made a good deal of stir in dental circles, and the desire to participate in the benefits offered has brought a large number of new applications to the society.

All these causes have contributed to the increase of numbers, and this is as it should be. The society should be the great inclusive body of dentists, and every dentist should be ashamed *not* to belong, and add his little to the weight of membership which makes the strength of the organization, and makes it a power for good, both to the profession and to the public. The only requirements of a dentist for membership are that he shall be registered in Massachusetts and that he shall be an ethical practitioner; a small enough standard, and one that any man should be ashamed of failure to measure up to.

Every one of us should help to create that public opinion that would make it necessary for any non-member to apologize to every one he meets for the fact of his not being a member.

Financially the society is strong. The budget system is tending to keep the expenditures of the committees and officers to a known limit and the increasing membership adds to the revenues so that the amount in the treasurer's hands is increasing. Again, this is as it should be, as the society may see the time when a proper reserve in the treasury will be a very comfortable buffer between it and some financial shocks.

I cannot leave this subject without expressing my appreciation of the self-sacrificing manner in which our Treasurer,

Dr. Paul, served the society at the New York meeting of the National. Owing to the conflict of dates and dues between the National and the Massachusetts societies many members of this society had not paid the extra dollar required for full membership in the National, and the list of those who had so paid was being increased daily till the time of the meeting. The registration of the Massachusetts members was therefore made a separate matter in New York and Dr. Paul took charge of the booth for that purpose, as being the one man who had the accounts and could do it intelligently. As attendance at the booth had to be practically constant during the meeting, Dr. Paul not only had the work of registration to do, but also was obliged to miss seeing and hearing the things offered to the members in the clinics and papers. For this service I want to tender to Dr. Paul the thanks of the Society.

As nearly as I can find out there are now twenty members of this Society in the service of the United States or Allies for the war. The spirit of the dentists of Massachusetts in their response to the call for volunteer service for the enlisted men, and afterward for those conscripted, has been most admirable, and the result of the unpaid patriotic work of these volunteers has been to materially improve the physical condition of the soldiers of our common cause. This service too has not been entirely free from discouraging features due to the unreliability and lack of appreciation on the part of the men served. We, as a profession may well feel proud of this service.

I recommend that the dues of the members now in the Service be remitted by the state and district societies, and that our delegates to the National use their influence to have similar action taken, if it has not already been taken.

The insurance feature of our society as arranged by the Law Committee has been somewhat neglected by the members. At the time of writing this there were 321 members insured in the liability group policy and 96 who are insured in the health and accident group policy. Under the latter policy there had been paid to members \$2,800 for the past year with 22 claims and under the former about \$3,000 with 14 claims.

The liability policy takes the place of the service in defence

of members sued for mal-practice as previously offered by the society. This protection, if bought separately by the members would cost each one fifteen dollars. Under this group policy the cost is ten dollars. Here is a saving to each member of the amount of his dues, and as the Society is not now prepared to defend its members, it seems that no member could afford to be without this protection.

The saving is still more marked in the health and accident policy under the group system. The very same protection offered in this policy would cost from twenty to forty dollars more if bought separately. Of the desirability or necessity for carrying insurance against accident or illness I will not speak, as this is a matter for each one to settle for himself. In any case if a member insured goes into the service of the United States he can cancel his insurance and get back a part of his money paid, pro rata for the time actually insured. Those of us who want either of these forms of insurance should look into these group policies.

During the past year the Society has lost a very old member, Dr. Edward Page, who was treasurer of this society for many years. He had long been retired from dental practice, and for some time had also given up his active business as manufacturer and dealer in dental alloys. He died at the age of 91 at the Home for the Aged Men on Springfield St., Boston, where his funeral was held. Your President represented the society at the funeral, and a floral tribute was sent.

It is the privilege of the President to make public in his annual address his ideas for the work and management of the Society for the coming year or years, and so leave them in concrete form for the consideration of his successors.

As the Society is conducted by the officers and committees at present in a way that seems best to all concerned, I have very few radical changes to suggest. My recommendations are as follows:

First: We have two Vice-Presidents who are, or should be, in training for the presidency of this society. During my incumbency in the vice-presidency no opportunity was apparent for this training. A fairly active course of labor on the executive committees of the Metropolitan District and this Society,

with a term as Secretary of the Metropolitan District gave me an insight into the workings of the society, so that when I was elected President I was not at a loss to know the ropes. My information was in no way acquired when I was Vice-President nor on account of that office. I have no complaint to make; far otherwise. The Presidents were cordial and showed no disposition to keep any one out of the management, but there was no place for the Vice-President to fit into. I suggest that the Vice-Presidents be made, ex-officio, members of the executive committee of the society, increasing its number of members by two to include them, and that the chairmanship of some of the active committees of the society be given them whenever their residential position makes it possible to perform the duties of such chairmanship without too much hampering the work of the society. This seems to me to be a good method of so training the Vice-Presidents that they may advance to the presidency without feeling what the secretary of the Southeastern district called "a little green."

Second: I recommend that each district society arrange annually a course of graduate work for its members. This might be done by the executive committees or by special committees appointed for that purpose. Each member taking such a course should pay a fee for it sufficient to cover the cost of the work, and the best available talent for clinicians or lecturers should be secured. In the Metropolitan district this work might be arranged, if mutually acceptable, with one or both of the dental schools of Boston. The work carried on by the State Society is not available to the members living at a distance, and the loss of time and expense of travel makes it much better to have such work done by district societies. A committee of the state society might be appointed to coöperate with that of any district which might ask such coöperation.

Third: A further suggestion which would require no change in construction of any committee or by-law is that each Secretary of a district society shall include the President and Secretary of the Massachusetts Society in his mailing list and send to those two officers at least, the notices of the meetings held in the district. As it is at present, the president or secretary of the

parent society knows nothing of the doings of the district societies except accidentally. Such knowledge could do no harm, and might do much good in keeping the whole society in better touch with its parts. The cost would be trifling, and I have no doubt that the secretaries would be glad to do this, once their attention is called to the matter.

Fourth: During the past year the influx of new members to the Metropolitan District has overwhelmed the board of censors, to such an extent that names have been passed without the sort of consideration that the importance of this scrutiny demands. I suggest that this board of censors require that the two sponsors of any applicant for admission to the district society each write a personal letter to the censors so that some knowledge of the extent of the acquaintance of the sponsors with the applicant, and the extent that they are willing to vouch for him, may be had before action is taken.

In closing allow me to thank the officers and members of the various committees for their invariably cordial support, and their hard work for the good of the society which has made my term of office pleasant and the work of the Society possible. I also wish to express my deep appreciation of the honor of the presidency of this Society. My only regret is that my capacity was not greater to produce still greater and better results for our common welfare. May the Massachusetts Dental Society continue to prosper and to stand for the best things in dentistry.

THE PORCELAIN JACKET CROWN AS AN ESSENTIAL IN MODERN DENTISTRY¹

By J. M. THOMPSON, D.D.S.

SINCE the advent of the roentgenogram in dentistry and its bringing so forcibly to our notice the diversity of troubles caused by faulty treatment of our masticatory organs, thinking dentists are recognizing the fact that extreme care and skill are in demand to a greater degree than at any time in the history of dental practice.

The medical profession is at last awake to the fact that the twenty teeth of the child and the thirty-two of the adult really play an important part in the human economy. The thoughtful M. D. is playing fair while the thoughtless and unscrupulous ones are using the dental profession as a dumping ground.

This condition to a certain extent we have brought upon ourselves because we have been too busy with the mechanical part of our work and followed leaders, good, bad and indifferent in our methods.

The X-ray, with its all-searching eye, has pointed out the spots wherein our sometimes well-meant efforts have failed; and also to the glaring defects of some of the most commonly used methods in filling and crowning teeth.

Pyorrhea alveolaris, that term which covers a multitude of sins, finds its incipient cause in malocclusion, want of occlusion, bands irritating the pericementum, poorly filled roots, etc. Consequently it becomes necessary to discard all methods which may produce irritation of any kind and adopt those which meet the requirements of up-to-date practice.

If called upon to state if there ever was a perfectly fitted gold shell crown, I might say yes; but the man that made it didn't know it; and never was sure until perhaps the tooth was

¹ Read before the 54th Annual Meeting of the Mass. Dental Society, May 1-3, 1918.

extracted. Many persons have lived long and useful lives wearing shell crowns for years and have carried them to their graves, but that is not conclusive evidence that they would not have been better off without them.

Recognizing this fact several years ago after having used porcelain jackets, I have in all cases as far as circumstances would permit used the same preparation for my gold crowns as I do in porcelain.

The porcelain jacket was originally intended for teeth with vital pulps. The beautiful adaptation secured in these crowns and the absence of irritating margins has led many to adopt the jacket crown idea.

We are told by some of our most thoughtful men that to remove the enamel from a tooth and replace it with a jacket of porcelain is contrary to all reason, yet some of these practitioners do not hesitate to place from one to three large fillings in a tooth for recurrent decay to get in its work and ultimately cause death of the pulp and possible alveolar abscess through neglect and ignorance on the part of the patient.

Three years ago I was a guest in a large western city where good work is always expected, and immediately afterward was in a large eastern city where good work is also expected. The West was in favor of saving all pulps at any cost and the extracting of all teeth showing poor root fillings with rarified apical spaces.

In the East they were devitalizing all teeth where the pulp might be endangered and putting buttons on the end of the root fillings. A middle course in dentistry doesn't seem to enter into the minds of some of our leaders and the man who can listen to both sides and practice dentistry is going to do the most good for humanity in general.

In preparing this paper, I have thought that it might be of interest to give the history of the jacket crown and a short sketch of the evolution which has taken place in the methods of making crowns, from the first of which we have any history, up to the present time. To attempt in detail a description of each crown would occupy too much time, and quoting from a paper read in New York some years ago, I will say that the crown which may

be used in the greatest number of cases involves ideas contained in the pivot tooth of Fauchard, the two tube crown of Dr. Smith Dodge, of New York, the Lawrence or Foster crown, the Mack crown, the Gates-Bonwill, the Howe, the Weston, the Howland-Perry, the Logan, and the platinum jacket crown; also the all porcelain hood and overlap facing introduced by Dr. C. H. Land. With slight alterations of shape and the use of metal instead of wood for dowels, the tube principle has survived all the others. This is proved by the numerous variations of detachable post crowns now upon the market.

In 1903 Dr. C. H. Land introduced an all-porcelain jacket for vital teeth. This was shown for the first time in a society meeting at Rochester, N. Y., and later described by Dr. E. B. Spalding in "Items of Interest." Your essayist enjoyed the distinction of putting on the only jacket crown made at the International Dental Congress at St. Louis in 1904. Since that time this kind of crown has been generally used by many men in different parts of the country. Essentially the jacket is a modification of the tube crown, one of the first and best crowns ever given to the profession.

In preparing an anterior vital tooth to receive a porcelain jacket, it is necessary that all enamel be removed, in order to allow room for a sufficient thickness of porcelain to be placed upon it. In years past, many have raised objections to this crown, on account of what seemed to be a needless torture of the patient. This objection is purely psychological, as results have been obtained in the majority of cases with little or no pain, or at the most, not more than would be inflicted in preparing an ordinary cavity for a gold filling. Many methods have been used to perform this operation painlessly, among them being pressure anesthesia, ether spray, gas and oxygen, analgesia and conductive anesthesia. Of late, conductive anesthesia seems to have the most promise and to have superseded all the others. It is necessary in the use of conductive anesthesia to take a picture of the tooth to be operated upon, which will disclose the location and extent of the pulp chamber and guide us in our work. Where interosseus injections are made, they should not be made too close to the apex of the tooth to be operated upon, as the pulp

may be affected in this way and not recover from the shock. The technic in preparation of the tooth consists of first making sharp cuts across the labial surface with a small knife-edged stone, and then crossing these with similar cuts, making little diamond shaped spots of enamel. The lateral walls are then cut away with thin separating stone, this cut forming the shoulder on both sides. At this time ferrules for taking impressions should be carefully fitted and laid aside. A cross cut fissure bur is then used in removing the enamel from the labial and lingual surfaces and the tooth rounded into shape. The shoulder is finished by using end cutting safe sided burs of a suitable calibre to make the shoulder the proper depth.

When this has been properly done, the ferrules are filled with compound and two impressions taken, one for a cement model and one for an amalgam model. The amalgam model is to bear the brunt of the work, while the cement model may be used as a master model at the finish, because I believe that finer work can be done upon a cement model when the final bake is made.

During the winter of 1916 and 1917, Dr. O. W. White, of Detroit, was instrumental in forming what is known as the Clinic Club of the First District Dental Society. This Club has a membership of about 80, divided into sections covering all phases of dentistry. The porcelain crown section of which Dr. A. L. LeGro is Chairman, adopted the principle of the jacket crown as the one above all others, and developed a technic which has made it possible to form a crown by the indirect method, which needs no grinding or finishing of any kind when ready to set. An outline of the technic is as follows:

We will take as an example a devitalized molar, the roots of which have been previously treated and filled, and verified by the X-ray. Before the walls of the tooth are cut down too far, a measurement is taken, and two bands are made and fitted over the tooth. These are laid aside and the tooth ground down even with the gum line, with the edges a little below the free margin of the gum. The pulp chamber is then prepared to receive a cast or inlaid core, which extends into the root canals, which are prepared parallel to receive short posts. This core may be cast

of gold or pure silver. Pure silver is more acceptable than any of the metals like Weston's or Acolite. The indirect or the direct method may be used in forming this core. It is sometimes desirable to use the direct method, as it saves one office call for the patient.

After this is ready and cemented into place, the bands are fitted to the root and a modeling compound impression taken, and a cement model made at once. Upon this cement model two tin foil matrices are made and two cement caps made upon them. One of these is placed upon the tooth and acts as a guide for the seating of the model in the impression which is now about to be taken. The other is to be worn by the patient during the time in which the crown is being completed.

Modeling compound is used as an impression material, in preference to plaster; the consistency of the compound is such that it enables us to force the cement cap into its exact relations, and at the same time secure the articulating surfaces of the adjoining teeth in an accurate and stable material. Experience has shown that plaster works in between the cap and the root and upsets the fine adjustment of the model later. The modeling compound should be thoroughly warmed and placed in a tray, and the part next to the tray chilled in cold water, and before taking the impression, the upper surface should be heated over an alcohol or gas flame, and in this smooth, shiny condition, a little cake of cocoa butter rubbed over the surface to avoid its sticking to the teeth. After the impression has been thoroughly chilled and removed, the amalgam model which has been prepared is then placed in the cement cap and waxed into position by enough material to make a little gate in the plaster model.

The adjoining teeth are then packed with cement into which little staples are placed, which form a union with the plaster, which is now poured into the impression. This produces a model which is accurate in every way, and then the wax is cut away from the amalgam model so that it may be removed and worked upon, the same as taking the individual tooth right in your hand.

The impression for the opposing teeth is also taken in modeling compound and after being thoroughly chilled, the ends are closed with other modeling compound, so as to make a receptacle

into which Spence metal may be poured. Those of you who are familiar with Spence metal know that this material melts at a little below the boiling point of water, and if properly handled may be poured into a compound impression, and a very sharp model secured. Before pouring it is necessary, however, to oil the impression with paraffine oil. If a plaster impression is taken, it must be flooded with oil which is displaced as the Spence metal is poured into the impression. The object in using such a model is that the black material is very hard and marks the high spots on the crown better than carbon paper.

The method of securing the articulation, as described by Dr. LeGro, consists of two tin foil cups made by burnishing No. 40 tin foil over the models and reinforcing the sides with sticky wax. These are then placed in the mouth and the patient is asked to close the teeth in their proper relation, and these two cups are joined together by more sticky wax. These are removed and the models placed in them and mounted on Kerr's anatomical articulator. Some prefer the wax bite and others prefer making models of both the upper and lower jaws, in order to do away with any possible tilting of the models in their narrow wax bite. After this is done, we are ready to start work upon the crown, and in this connection, I would say that the technic up to this point is just as good for gold as it is for porcelain.

In view of the fact that porcelain shrinks about one-fifth of its bulk, a strip of pink base plate wax is wrapped about the model, just even with the margins of the root and this acts in a twofold manner. It holds the matrix in place and increases the circumferences of the root enough to overcome the shrinkage in the block of porcelain, which we are about to prepare. A piece of clean, white paper is now wrapped about the model and a loop of Cutter's waxed floss passed around it and fastened by simply twisting the ends down tight.

Having determined the color of the crown to be made, we mix the darker or underlying body of porcelain and pack it into this paper tube, having it higher at the center than at the margins. Then the next color is mixed and placed over it. This mass is then vibrated until every particle of moisture that can be brought to the surface is removed. The element of hardness obtained by

this method is most surprising, as a block of body is secured which almost has the consistency of a crayon or chalk. In fact, it has been made so hard that a sentence has been written on the blackboard with it. This block of porcelain is now carved to the shape required for the case at hand, care being taken not to remove any from the portion forming the mesial and distal surfaces. The wax is carefully removed from the model and all porcelain carved and brushed away from the margins of the matrix. This is then removed from the model and placed in the furnace and given a high biscuit bake. After this has been done, it is placed upon the model and the model placed in its accurate relations in the plaster model, and any grinding or shaping that is necessary is done at this time. If it is necessary to place a little more of the porcelain to complete contact points or cusps, it may be done at this time and the crown completed, excepting the margins. After this has been completed, the margins are re-burnished and the crown finished with porcelain that fuses at a slightly lower temperature.

Color schemes in anterior crowns are the most difficult ones with which we strive. To imitate in a satisfactory manner an animal substance with a resisting mineral substance and to produce a substitute which will in all lights have a natural appearance requires a good eye for color and a knowledge of how the different shades will harmonize when fused together. It is almost impossible to take a stock tooth and make a baked crown and have it as satisfactory as the hand-carved or spatulated crown. We have known for years that an inlay made of several colors laid one over the other more closely resembles the tooth into which it is inserted than one made at one or two bakes without regard to such a principle. This is equally true of the tooth as a whole, as we very often find cases where in order to secure a harmonious blending of the colors found in the adjoining teeth, we must make one side different than the other. Experience is a teacher which conducts its business upon a pay-as-you-enter, or to be more accurate, as-you-leave basis, and it is owing to this fact that many become discouraged and do not continue doing porcelain work. There are so many little reasons why we fail that a little thought on a few general principles should make

mistakes more rare occurrences. Take one little matter of technic, for example. Many times, after we have secured a block of body and have it nearly ready for the oven, we may chip off a little corner, which at that stage of the work would seem very important. The novice generally tries to replace it at once, but the old head who has had sad results from trying this will fuse or biscuit the case as it is and add the fresh material later. His reason for this is that adding moist porcelain to that which is nearly dry upsets the consistency of the mass and causes checking and weakened results.

In Vol. 2 of the American System of Dentistry is a treatise on the moulding and carving of porcelain teeth by W. R. Hall, D. D. S., of Philadelphia which, though it has been before the profession for thirty years, is so full of instruction that any one who is working porcelain or is about to begin cannot afford to lose any time before reading it.

Porcelain teeth are composed of feldspar, silica and clays of different kinds including kaolin. The colors are obtained by the use of titanium oxide, platinum, cobalt, iron, gold and tin. From these materials are formed tooth bodies, coloring frits and enamels.

The body which represents the dentin of the natural tooth is composed of feldspar, silica, kaolin or other clays and is colored with titanium oxide. The frits are finely ground crude colors to which are added small quantities of feldspar and other fluxes. These are then burned in a muffle and pulverized for use in making enamels.

Enamels are feldspar colored with the different frits to resemble the colors found in natural teeth.

The translucent quality of porcelain is dependent principally upon the percentage of feldspar which enters into its composition. In the average tooth it forms about four-fifths of its entire bulk and acts as a flux to bind the other materials together.

Next to this the silica forms the greater part of the remaining fifth and gives stability and strength for masticatory purposes. The kaolin and other clays give plasticity to the mass and in contracting during the fusing process, binds the other materials closely together.

The following is a fair example of an average formula for ordinary porcelain body.

Kaolin	1 oz.	
Silica	3 "	
Feldspar	18 "	This is for a
Titanium Oxide	65 gr.	moulded body.
Starch, 10 gr. to each ounce		

Kaolin	1 oz.	
Silica	3½ "	
Feldspar	14 "	for carving.
Titanium Oxide	40 gr.	

In moulding teeth two colors are usually used. The enamels or lighter color is the first laid in and is made of good thickness at the incisal portion while it is graduated to a very thin layer at the gingival portion. The darker shade is now put in and the mould closed under pressure. The mould is then heated about as hot as an iron used for pressing would be and then allowed to cool. After it is cool enough to handle, the tooth is readily removed and trimmed. It is then laid upon a fire clay slab which has been covered with powdered silex and placed in the furnace. Teeth with pins such as flat backs are laid upon forms which have slots cut in them to receive the pins.

The time is at hand when the man who is satisfied to buy his crowns at so much per crown and grind them without even a thought of restoring the glaze, must be given to understand that he is in a class by himself and deserves a reprimand. A second offense, to say nothing of the third, means that he is an iconoclast and should be treated as such.

Detroit, Mich.

BLEACHING DISCOLORED TEETH BY MEANS OF 30% PERHYDROL AND THE ELECTRIC LIGHT RAYS¹

By DR. C. H. ABBOT.

THE object of this clinic is to acquaint those of the gentlemen present, who may not have heard of it, with a method in which the clinician became interested in Berlin, consisting of the action of powerful electric rays upon 30 per cent perhydrol solution.

This method is neither new nor original with the clinician, having been introduced into the dental practice by German dentists a year or two before the beginning of the war. It is also mentioned by Prinz in the latest edition of his "Dental Materia Medica and Therapeutics."

The machine in use in Germany is a Nernst lamp with lenses and reflector, manufactured by the Zeiss Company and rated at 2900 C.P.

As this is unobtainable in this country, at present, Dr. Hadley had an arc light machine constructed by the A. T. Thompson Company of Boston. It has the disadvantage of having to be watched constantly and developing much more heat than the Nernst incandescent lamp, so that the rays are liable to become annoying to the patient. But we have remedied this fault pretty successfully by the interpolation of a cold water filter which greatly diminishes the heat.

The converging lenses are arranged so as to produce a focus of about 2 cm. in diameter at a convenient distance from the lamp, which should be placed so that the rays strike the tooth at this diameter. The lamp is provided with a resistance so that the ordinary electric light current is used. The current should be switched on so that the upper carbon glows first, which can be determined through the mica window at the side.

¹ Clinic presented before the 54th Annual Meeting of the Mass. Dental Society, May 1-3, 1918.

The rubber dam must always be applied over the tooth or teeth to be bleached and firmly ligated, to protect the gums from the solution which while not permanently harmful, is to some extent irritating to the soft tissues.

One of the principal advantages of this method is the possibility of bleaching discolored vital as well as pulpless teeth, in the latter case without the necessity of removing the filling in the pulp chamber, when bleaching a tooth that has been treated and filled previously; but of course the result is obtained much quicker and more perfectly where the bleaching agent is applied in the tooth, as well as externally.

It goes without saying that when the pulp chamber is open, the apical part of the root canal should be hermetically sealed, otherwise the penetration of the solution through the foramen would cause considerable irritation and pain.

The bleaching agent, 30 per cent perhydrol, a neutral solution of H_2O_2 , made by Merck, seems preferable to 25 per cent pyrozone, as the latter has an acid reaction.

The preliminaries having been attended to, the perhydrol should be applied externally with cotton or gauze and, if the pulp-chamber and part of the root-canal or other cavities are open, internally as well, and the rays focused onto the tooth, which should be kept well moistened during the whole treatment.

The exposure should be timed according to the degree of discoloration and the susceptibility of the patient to heat. From 5 to 15 minutes should suffice for one treatment, which may be repeated two or three times until the desired result is obtained. As the tooth is often likely to "go back" a little after a few days, it is desirable to continue the process until it is a little lighter than its neighbor. During the two and a half years that the clinician has used this method in Berlin, he has not had to repeat the treatment, when once completed, but, even if discoloration should recur after a year or two, the fact that the tooth may be bleached again without the removal of the filling, seems a great advantage.

Should the cold water filter prove insufficient to cool off the

rays, a blue glass filter may be added, which cuts out the heat rays most effectually, but of course curtails their bleaching power more than the water filter.

An asbestos paper screen with a small window for the transmission of the rays, helps to protect the gums and lips and is to be recommended.

It was more or less accidentally that the clinician found that teeth could be bleached by this process without applying the agent internally. A dark looking central incisor that he was trying to open up for treatment, turned out to be "very much alive," and the perhydrol was applied externally with the light rays, as an experiment, with a result surprising to the operator and most pleasing to the patient.

The question as to which of the properties of these light rays are instrumental in producing the result is interesting and seems as yet undecided. Many consider that the heat only, which is generated by the rays, intensifies the liberation of nascent oxygen and that hot instruments applied to the cotton or gauze, produce the same effect, but the supposition that the combined action of heat, light and chemical rays upon the color compound is responsible for the bleaching action, as suggested by Prinz, seems the most rational explanation.

Head, in his excellent work, "Modern Dentistry," says on page 128: "Discolorations due to a chemical or purely mechanical cause, while distressing, are not a pathologic danger sign; but discolorations caused by pulp infection and infiltration into the tooth substance are not only unsightly, but a menace to the general health of the patient. And yet it is not always an easy matter to decide which type of discoloration is presented to us. It may be a combination wherein the tooth has started to discolor through pulp deterioration, and has been assisted along its uncosmetic path by pulp-canal dressings, such as iodoform or oil of cloves. Such chemical discolorations cannot be bleached by any known materials."

The clinician must disagree with the author in this respect,

as he is convinced that even such cases can be greatly improved by subjecting them to his process. Indeed his first case was of this nature and had made him a convert to this method.

Boston, Mass.

MASSACHUSETTS COMMITTEE ON PUBLIC SAFETY¹

By J. F. O'CONNELL, Publicity Committee.

WHAT THE DENTISTS ARE DOING

THE dentists of Massachusetts quite rightly are "pointing with pride" to the fact that they were one of the first groups of professional men in the State to show that "preparedness" for war was part of their working creed of patriotism and of civic efficiency.

When in the spring of 1916 the National Guard was mobilized for service throughout the State, at a time when the course of the nation toward the war in Europe was not clearly defined, the condition of the teeth of the men of the Militia was investigated by representative leaders of the profession, and it was found that radical action was necessary if the men were to do their most efficient work as soldiers, whether in Mexico or, later, in Europe. A call went forth to the profession at large for voluntary action and most of the men in it realized that they had a unique opportunity for invaluable service. Working with the Surgeon-General of the Guard, the Massachusetts Board of Dental Examiners took the job of unifying and directing the labor of the volunteers, and when the report was made to the State Executive through the Committee on Public Safety—with which the Board of Dental Examiners worked—it was found that seven hundred dentists and the staffs of the Harvard and Tufts Dental Schools had performed over 40,000 dental operations.

This record was not only creditable to the dentists of Massachusetts, it was also educational in its effect on the profession at large. In 1916 the Preparedness League of American Dentists came into being, and was endorsed by the National Dental Association. This League at once began to assume responsibility for supervising all dental work to be done by volunteers for the selected men of the National Army, Lieutenant W. A. Heckard

¹ Read before the 54th Annual Meeting of the Mass. Dental Society, May 1-3, 1918.

of New York being assigned by the Surgeon-General of the United States Army to coördinate the efforts of the League and the War Department. The plan worked out by this coördination of forces called for a dental director in each state, and it fell to Mr. C. Richard Lindstrom of Boston to lay the foundations in Massachusetts during the period of the first selective draft. When he resigned the responsibility passed to Dr. Charles M. Proctor, his successor, with Doctors Edward C. Briggs, William Rice, William Flynn and C. R. Lindstrom as a general committee.

Once the dimensions of the task were really seen, and when the Federal Government and the profession had come to terms as to how the voluntary service of the dentists to the Army was to be directed, the Massachusetts Committee on Public Safety saw that it must expand its aid and enable the State director to handle his job under suitable conditions. More room at the State House was assigned for the use of the League, and its work is now directed on the administrative side by the League secretary, Mrs. M. B. Nichols.

Organization of the state division of the National League has brought into being a very loyal group of workers, including the best dentists of the state and the men responsible for carrying on the dental colleges. Almost every draft board district has its own dental chairman, who conducts the oral examinations if so requested. He assigns men who cannot afford to meet the necessary expense of dental treatment to a local dentist, who has agreed to give his time, material and skill to service for the soldiers, counting it as part of his service to his country and his way of helping on the day of triumphant democracy. There are 1560 such enthusiastic dentists in the State, active as voluntary conservators of the manhood of Massachusetts, whether in cantonment or at the front. Of late the pace of examination and service men has increased, and hence the record for the past two months is 15,000 free operations. There may be other states in which this record has been surpassed, but they are not many.

The results for the State of Massachusetts will be shown in a variety of helpful and significant ways as the war goes on. Her men at the front will be better nourished because of the healthier

state of their mouths, and because their digestive organs are not infected. If injured and invalided these Bay State men will have better chances of recovery because they are clean-mouthed. Such of them as come in touch with the Red Cross and social welfare workers in France, where a campaign of hygiene of astounding size and significance is under way under American direction, will be more certain to aid the conservators of the child life of France as they make the first beginnings in teaching oral hygiene to the natives of the rural villages. Last but not least, the soldier who returns, knowing that much of his exemption from disease has been due to his care of his mouth and teeth, is going to be a good missionary.

MASSACHUSETTS DENTAL SOCIETY

REPORT OF CLINICS, MAY 1-3, 1918¹

The clinics this year proved a popular attraction to our members; over four hundred tickets being issued. A report of the progressive clinic given by the Harvard University Crown and Bridge Club is appended.

The open clinic was as follows:

Dr. J. W. Beach of Buffalo, N. Y., showed some clever work in partial dentures and bridges in which the use of the round and half-round wire clasp was featured. He also showed how interdigital wires could be used to prevent the posterior part of the appliance from lifting.

Dr. C. T. Warner, of Boston, presented steps showing the correct construction of the Bent Clasp. This type of clasp is formed by the skillful use of contouring pliers; No. 24 gauge, high-fusing clasp metal being first cut to pattern and then adapted without any swaging.

Dr. J. M. Thompson, of the Detroit Clinic Club, showed the various steps in constructing a porcelain jacket crown. His work

¹ Read before the 54th Annual Meeting of the Mass. Dental Society, May 1, 2, 3, 1918.

is done on metal dies by the indirect method, and the technic has been so perfected that very accurate results are possible.

Dr. Charles H. Abbot, assisted by Dr. A. I. Hadley, gave a clinic showing a new method of bleaching teeth, a report of which is appended.

Dr. Percy R. Howe, assisted by instructors from the Forsyth Infirmary, showed his method of infiltrating dentin with an ammoniacal solution of silver nitrate, using a formalin solution for the reducing agent. By this means pure silver is actually deposited in the tubules of the dentin and in fine root canals, which would be difficult to fill by any other means.

Respectfully submitted,

NORMAN B. NESBETT, D.M.D.,

Chairman Clinic Committee.

PROGRESSIVE CLINIC

Progressive clinic on crown and bridge work by the Harvard University Crown and Bridge Clinic Club.

The Clinics started at 2.30 sharp and were conducted or given by ten of the club's members and consisted of:

"The All Porcelain Jacket Crown," by Dr. J. F. Hovestad.

"Cast Gold Inlays For Bridge Abutments," by Dr. M. Peters.

"Cast Gold Base For All Porcelain
Crowns." } by Dr. Fred Beckford.

"Glove Fit Seamless Crown,"

"All Porcelain Crown (file method)," by Dr. R. Ruelberg.

"Contoured Richmond Crown," by Dr. F. W. Hovestad.

"Contoured Half Crown With Post," by Dr. R. R. Andrews.

"Contoured Staple Crown," by Dr. W. N. Roberts.

"Contoured Cast Staple Crowns," by Dr. H. Sowles.

"Contoured Cast Gold Crowns," by Dr. Wm. P. Cooke.

Dr. J. C. Slack substituted for Dr. Cooke.

These clinics showed a definite line or principle of crown construction; all men worked in accord, bringing out the great need for, and the technic of, a perfect root or crown preparation

and the art of restoring in the artificial crown the normal tooth form or contour.

Each clinician showed the various steps mounted on natural tooth forms, these being mounted on a black strip of wood in brass tubes. This enabled the clinicians, at a given signal, to pick up their exhibit quickly and move to the next table. It proved very satisfactory to have the clinicians move instead of the group of men. Twelve minutes' time was allowed for each table, two minutes for a new start.

Special attention may be called to the fact that precious metals were used for all the steps and the finished work.

DR. J. F. HOVESTAD,

Chairman of the Harvard University Crown and Bridge Clinic Club.
220 Marlboro St., Boston, Mass.

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EDITORIAL DEPARTMENT

THE WORK OF THE PREPAREDNESS LEAGUE

A glance at recent figures¹ of the work performed by the members of the Preparedness League of American Dentists will show, in a manner more eloquent than words, the magnitude of the service this organization is rendering our fighting men. The membership of the League during the past year has grown from

* 1st Lieut., D. R. C., U. S. A.; on active duty.

† 1st Lieut., D. C., N. G., U. S. A.; on active duty.

¹ See p. 300.

4,000 to 16,000; the scope and limitations of the work for which it is best qualified have been defined, and the experimental phase of this unique association of civilian dentists may be considered complete. The machinery is running, guided by competent hands, and a splendid record of achievement is rolling up.

It is human to look for the signs of an early peace; but it is safe to assume not only that there is much work yet ahead for the fighting man, but that, come what may, our Army and Navy will continue to be great establishments of man power during the many and fateful years of world reconstruction before us. The present generation very probably will not see anything like the disarmament of nations or even the reduction of armies to nominal quotas. The real need for international police, under the best conditions to be hoped for, will require large standing forces recruited from year to year by American youth. These youngsters, coming from all walks in life, will present dental defects when timely help will be of life-long benefit. Hence the likelihood that the work of the League will be needed for many years to come.

If it is your misfortune not to be in uniform in these great days—if your way does not open to glory in the making of history—at least it is your privilege, for the comfort of your soul in years to come, now and today to offer your share of the kind of service you are qualified to give those who fight our battles. Now—and not next week or next year—is the time to report for enrollment at your local organization of the P. L. A. D.

UNITED WAR WORK CAMPAIGN

To follow shortly after the Fourth Liberty Loan—the greatest feat of its kind ever undertaken—and being always resourceful and ready for another “drive”—the American public will be called upon during the week of November 11-18 to *give* \$170,500,000

to the Y. M. C. A., the Y. W. C. A., the K. of C., the Jewish Welfare Board and the associations affiliated in the United War Work Campaign. The need of the money and the preëminent worthiness of the cause to which this army of salvation is devoted, are too well known to require more than passing reference; but the following pen picture from one² who knows conditions on the vast battlefronts is impressive and appealing:

Never in all history has there been such an assemblage of the manhood of the world as that met on the plains of France to-day. In one of the great English base camps are gathered countless thousands of men in khaki from every county of England; hordes of dark-skinned East Indians in picturesque turbans and native uniforms of khaki; men with tanned faces from the wind-swept plains of far-away Australia; Scotch Highlanders in their khaki kilts and gray tam-o'-shanters; New Zealanders in their broad-brimmed felt hats; Canadians, West Indians, South Africans—men from every corner of the far-flung British Empire; gallant Belgians, Frenchmen in their blue uniforms, swarthy Arabs from Northern Africa in their red fezzes, Chinese coolies from the Far East, German prisoners in their faded gray-green—men from every reach and quarter of the world. There has been nothing like it since the days of the old Crusades; since the time of Peter the Hermit there has been never such an opportunity to minister to the congregation of the world. In a vast tented city, covering the French plain for miles, this motley throng dwells for two or three weeks, receiving the last word of instruction in bombing, in the use of gas-masks, on where and how most effectively to thrust the bayonet home. It is easy to imagine the thoughts of these men who are, most of them, thousands of miles from home in a strange land, and stripped of all the comforts of life, and who are preparing themselves to enter the most horrible experiences that this world can offer. Little wonder that they are thinking as they have never thought before, and wondering, amid the tragedy and the ruin all around, what, after all, in life and death is worth while and fundamental. Was there ever such an opportunity for a creative, healing work for the bodies and minds and souls of men?

The "huts" of the Y. M. C. A. and of its brother organizations abound wherever our Allies meet—mere dugouts near the firing line—large buildings with the facilities of clubs where such are practicable. Our boys find bodily comfort, rest, amusement

² F. B. Sayre, *Harper's Magazine*, 1918.

and spiritual cheer in these myriad homes of the battlefield. The lonely boy, adrift in that world of desolation, is there given what is needed to warm his body and his heart—to keep his courage up—to look beyond the hardship and misery of trench life to the home, Country, and the dear ones he is fighting for. Can there be a more important mission than to keep that boy true to the best that is in him; to prevent, perchance, that discouragement that leads so easily to the reckless fatalism of the soldier of fortune—inviting moral and physical disaster? Let every American stand back of this noble work. If he thinks he is tired of giving, let him reflect that he probably does not know what it means to be tired.

CURRENT DENTAL LITERATURE

COMPILED BY ARTHUR H. MERRITT, D.D.S.

Titles marked with an asterisk are abstracted briefly.

Dental Cosmos, June, 1918.

26 Replanting *Versus* Apicoectomy.

C. E. Kells.

The statement is made that apicoectomy is most likely to succeed where it is least indicated, if not wholly unnecessary, and that it is most likely to fail where it is most needed, whereas replanting offers the best chance of saving such teeth. Few teeth replanted by the author have failed within ten years, and he prophesies that with improved technic and methods they may be so replanted as to preserve the pericementum and insure permanent results. While replantation is best adapted to single rooted teeth, it may be practised upon lower molars where the roots are not curved or too divergent. The following technic is advocated: Take an impression of tooth to be operated upon with one or two on either side of it and strike up a splint of pure gold 35 gauge; put in place and burnish to teeth; remove and flow 22-k. solder over interdental spaces. The parts to be operated upon are cleansed and all instruments carefully sterilized. An irrigating device for the use of warm normal salt solution is recommended. Novocain-suprarenin is used, the tooth and gums isolated by means of napkins, and the latter carefully dissected from the tooth with as little injury as possible. The tooth is then extracted with smooth-beaked instruments, that carefully fit the root, and placed upon a sterile napkin. Subsequently it is wrapped with sterile tape and tied with sterile silk to facilitate handling without contamination. Following extraction, the socket is carefully curetted, washed out with warm saline solution and packed temporarily with small sterile gauze pads.

The root canal of the tooth is next sterilized and filled with oxychloride and the end of root cut off if necessary, which is not always the case. The end of root and filling must be perfectly smooth. Remove packing from socket, wash out blood clots with warm saline solution and induce slight bleeding. The tooth, which has been bathed in warm normal salt solution, is then grasped with sterile tweezers and gently forced into place and securely held for about two minutes. The blood which oozes out at the margins of the gums is wiped away and the splint cemented into place with oxyphosphate. This should be allowed to remain from four to six weeks, at the end of which time

the tooth should be quite firm. The advantages claimed for replantation over apicoectomy is that the operation can be begun and completed in one day, though it is desirable to have the patient under observation for a few days; that the condition of the root canals and the area of infection are infinitely better following replantation than they are after apicoectomy; and that whenever a tooth or root can be extracted without injury to itself, replantation is the preferable operation.

Dental Cosmos, July, 1918.

27. *The Nature of Pericemental Abscesses upon Vital Teeth. M. Ray.

28. The Role of Sepsis and of Antisepsis in Medicine. Wm. Hunter.

27 The Nature of Pericemental Abscesses upon Vital Teeth.

The assumption that the so-called pericemental abscess is a gouty tophus of calcium urates deposited upon the root by the circulation, causing an abscess by hematogenous infection, is, in the opinion of the Author, incorrect. Such abscesses will be found upon more careful examination to be caused by infection taking place through a pyorrheal pocket, the cervical opening of which is not recognized because of its location at a point remote from the point of discharge. Cases observed by the Author were in the incisal region, and associated with marked over-bite of the upper incisors, and impingement of the lowers upon the lingual gingiva in such a way as to force back the mucosa upon the orifice of the pocket, thereby preventing easy exit of the pus, with the result, that it discharged through the gum at some distance from the pocket.

Dental Items of Interest, May, 1918.

29 Indication, Contra-indications and Technic for Root Amputation and Curettage. M. N. Federspeil.

Root amputation and curettage with proper post-operative treatment is a safe method in the opinion of the Author by which to eliminate chronic conditions such as root granuloma, epithelial tumors, cysts, apical necrosis, etc. It is also indicated in root apices that cannot be filled to the end. In chronic cases, the healing of morbid processes involving the apical tissues is not always successful when treatment is confined to root canals. A 2 per cent solution of apothesine to which adrenelin has been added, is recommended as an anesthetic. By deep infiltration of the tissues with this preparation successful anesthesia is obtained. The parts to be operated upon are cleansed and painted with glycer-iodin, packed with pads of sterile gauze and lips retracted. A horizontal incision is then made over the root end and the muco-periosteum retracted; the diseased area is cleaned out with properly shaped curettes clearly exposing to view the root end which is then amputated flush with the floor of the cavity. This

is followed by swabbing the wound with iodine and packing with iodoform gauze which permits of free drainage and stimulates granulation. The wound is repacked from time to time as indicated. The sewing of the flap is contra-indicated as being contrary to the principles of surgery. It is the belief of the Author that the tendency in granulomas is to destroy or render inactive their bacterial contents. They may, however, become active at any time as a result of hematogenous infection or the opening of the root canal permitting thereby the ingress of oxygen, by which the organisms are activated. Under these conditions the entire mass may break down, resulting in a suppurative granuloma, destruction of bone cells and rarefying osteitis.

Dental Items of Interest, July, 1918.

30. *A Discussion of the Responsibility of the Dental Profession in the Diagnosis and Treatment of Conditions in and About Root Canals. E. A. Coolidge.
31. The Present Status of Prophylaxis and Periodontia. J. O. McCall.
32. The Rational Treatment of Pyorrhea. A. H. Merritt.
33. A Consideration of the Physiology of the Mouth Tissues in Treating Diseases of the Same. H. W. Macmillan.
30. A Discussion of the Responsibility of the Dental Profession in the Diagnosis and Treatment of the Conditions in and About Root Canals. H. W. Macmillan.

In the treatment of these cases, correct diagnosis is of first importance, roentgenograms are essential. In cases of vital teeth where the root is crooked or constricted, the uncertainty of good root work is such that the pulp should always be conserved where possible. Where there is apical involvement it is important to determine whether the cavity in the region surrounding the root, envelops, or lies back or front of it; whether there is destruction or pericementum with denuded cementum; whether the infection has been walled off by the natural defenses of the body, or whether the condition is still developing, and finally whether the area of disturbance has a definite line of demarcation from the healthy tissue or whether it gradually fades away until it is lost in the shadow of healthy bone. Just how these are to be determined is not stated. Cases showing positive destruction of the pericementum denuding an appreciable area of the cementum and those showing a clear cut outline between the healthy and diseased tissue, should be regarded as serious. As a rule, root amputation or extraction is indicated. In teeth in which the pulps have been recently devitalized (preferably with a local anesthetic, though arsenic may be used), the first principle is to carefully *insert the broach to the apical foramen first and continue* the enlarging and cleaning *from that point out*, using different size of broaches, always with an up and down movement. The use of strong alkalies and acids is contra-indicated as the danger of injury to the periapical tissues is such as to more than outweigh their value. In cases with septic canals the greatest factor in their treatment is the mechanical

cleansing done in their enlargement. Antiseptics should be used with caution, because of their injurious effect upon the apical tissues. Alkalies and acids may be safely used to within a short distance of the foramen. Ionization has not proved in the Author's hands of great value. All doubtful cases should be extracted in justice both to the patient and dentist. Filling with chlora-percha and gutta-percha points is advocated, filling all canals to root end only. Surgical cleanliness is essential to success in every step of the operation.

Dental Summary, June, 1918.

34 A Method for Electro-Sterilization and for Root Filling with Zinc Chlorid and a Metallic Zinc Cone. L. E. Custer.

For the sterilization of the root canal and apical region, the Author recommends the use of Dakin's solution or alcohol to which has been added a few crystals of common salt to make it an electrical conductor, followed by cataphoresis. The voltage is to be increased until patient feels it, and held at that point for 10 or 15 minutes. The result is a liberation of nascent chlorine, part of which is cataphorically carried into the dentin, and part through the apex. The zinc cone should be first placed in the opening of the canal following the evaporation of the solution until it reaches the apex. If infection is suspected in the apical area, the cone is forced through the apex and the current continued. The canal is then filled with a permanent conductor of electricity. This consists of oxychlorid of zinc, to the powder of which has been added about equal parts of precipitated metallic zinc to make of it a conductor of electricity. To prevent rapid setting, borax is added to the liquid to the point of saturation. When set it does not shrink and is impervious to moisture. It is not, however, a permanent germicide. Should infection subsequently develop, the tooth and apical region can be quickly sterilized without removal of root filling, by the employment of electricity, having first exposed the zinc cone to which the current is applied.

Journal of the American Medical Association, Feb. 2nd, 1918.

35 Some Lessons from the Draft Examination. E. L. Fisk.

The Author, who is medical director of the Life Extension Institutes, states that not less than 60 per cent of the rejections among recruits is due to impairments of a preventable nature, due either to ignorance or neglect, and that 30 per cent are due to defective eyes and teeth. Regarding the effects of neglected teeth it is stated that "mouth infection is a menace to health and missing teeth indicate probable past impairment. A young man who has lost so many teeth that he is not eligible for military service, on that ground alone should be an object of concern to the community. Grave conditions of mouth infection are liable to develop into actual organic disease."

Journal of the American Medical Association, July 6th, 1918.

36 The Sin of Treating Symptoma.

H. S. Ward.

The Author reports several groups of cases which have been improperly diagnosed by observing leading symptoms only and failing to study the case as a whole. Coöperation with specialists is recommended. The largest group of cases reported relate to oral infections. Attention is called to the large number of hospital cases in what is termed the "down and out" class whose mouth and teeth have been grossly neglected, and the question raised as to whether their condition may not have been the result of their oral infection. While recognizing the value of prevention to future generations, through the teaching of oral hygiene, the problem of the "down and out" class still remains unsolved. It is one of the present-day problems in medicine, which touches all specialties. Conservative treatment is recommended, many deaths having been reported from too radical treatment. Apparently the best results are achieved by putting the patient in bed, clearing up the oral infection slowly, allowing several days to elapse between treatment according to the amount of reaction and recuperation of the patient. The plea is made to view the whole patient as a diagnostic problem, which if done, will give oral infection its proper place in medicine.

NOTES ON DENTAL PRACTICE

COMPILED BY WILLIAM D. TRACY, D.D.S.

Polishing Material for Dentures.—When a denture has been filed and dressed with the scrapers, the surface may be smoothed very rapidly by the use of equal parts of pumice, emery and silex of medium fine grit. By uniting these powders with equal parts of beeswax and hard oil the spattering and dust will be avoided and polishing will be a comparatively clean proceeding.—*The Pacific Dental Gazette*.

Cleaning and Enlarging Root Canals.—After desensitizing and a complete exposure of the pulp, by which I mean the gaining of sufficient access to see the mouth of each canal and to eliminate every curve encountered that it is possible to eliminate by cutting away the crown with a bur, one is confronted with the entering and cleaning of the canals to the foramina without making obstructions which prevent a successful operation. The one principle that has given the greatest success in my operations in canals is carefully to insert the broach to the apical foramen first and continue the enlarging and cleaning from that point out by a process of filing, curettment and raking with the graded sizes of broaches, always carrying on an up and down movement and never a turning or twisting more than a half revolution in one direction, and back the other way the same distance. There are several difficulties usually encountered, among which are the packing of debris and pulp tissue ahead of the broach, but this can be avoided if care is used. Another difficulty is in losing the canal after working for a time. This can usually be avoided if the broach is selected each time which will readily pass to the apical foramen.—EDGAR D. COOLIDGE, *Dental Items of Interest*.

Importance of Diagnosis.—Everyone who succeeds in having his cases of dental periclasia return to health must necessarily do precisely the same things in treatment. One may emphasize the importance of one phase of treatment above another; one may see a superior efficacy in drugs, in gas, in root surgery, or in polishing operations, but if any of the several factors which are grouped in the etiology of the disease are disregarded in diagnosis, failure will result.—PAUL R. STILLMAN, *Dental Cosmos*.

Proper Use of the Tooth Brush.—There is an impression abroad that straight up and down brushing will injure the gums, and if long enough persisted in will cause recession. The fact that this is not so may be explained by the histological arrangement in the gingiva of the fibres from the pericementum and by the thick pavement epithelium which cover them. Nature seems to have made provision against vertical stress, inasmuch as this is the force to which the gingivæ are constantly being subjected in

mastication. The same force applied horizontally with a brush will destroy the gingival attachment and inevitably lead to permanent recession. My own teeth, which have never been cleaned by a dentist and which have been brushed in an up and down direction for more than twenty years, show no abrasion or gingival irritation, and are clean. I have obtained the same results in the mouths of my patients wherever the method has been fairly tried. Its chief value lies in the fact that it is so simple any one can readily learn to employ it, and, most important of all, it is stimulating to the investing tissues of the teeth through the vigorous massage effect produced.—ARTHUR H. MERRITT, *Dental Items of Interest*.

Preventive Orthodontia.—Preventive Orthodontia is much to be preferred to the older methods of correction, undertaken after it has progressed to the aggravated and complicated stage that is sure to appear after the age of twelve. From five to eight, and the earlier the better, is the most advantageous age for treatment, because better results can be obtained, less time and effort consumed and no pain need be caused at this age.—FRANK A. DELABARRE, *Oral Hygiene*.

Manipulation of Amalgam.—A smooth, velvety plasticity during the time that the amalgam is being packed into the cavity (in all except small and shallow cavities) is absolutely essential to uniform results in adaptation. This condition of plasticity may be secured by leaving the excess mercury in the mass when the mix is complete, to be pinched out from each individual piece as it is carried to the cavity. By this means the setting of the amalgam may be retarded from four to six minutes. In the event that the amalgam may stiffen somewhat, a little more mercury may be added, which, with a little manipulation, will bring it back to the desired plasticity. This may be done without affecting the strength of the filling. If the operator chooses to weigh the alloy and mercury and use only sufficient excess mercury to secure a smooth, velvety plasticity, the excess may be retained, to retard the setting, and removed as expressed to the surface by the forcible and orderly condensation, making an equally strong filling from which excess mercury is as effectively and completely removed.—WM. E. HARPER, *Dental Facts*.

Conclusions in Regard to Pyorrhea.—It may be said that in the treatment of pyorrhea there are four things which should always receive consideration—possible systemic complications, occlusion, root surgery and intelligent home care by the patient; that when these receive the attention which their importance deserve, pyorrhea can be cured, pockets obliterated and health reestablished in the tissues involved; that where this is neglected, or where it is not skillfully done, a cure is impossible, though some benefit may follow even the most perfunctory treatment; that failure to cure pyorrhea is not due, as has been stated, to "pus-soaked cementum," but to inefficient treatment; that in the brushing of teeth it is quite as important that gums be massaged as that the teeth be kept clean; that there is nothing in the whole realm of dentistry more

important than the intelligent care of pyorrhea, inasmuch as it involves the very foundations of the dental arch.—ARTHUR H. MERRITT, *Dental Items of Interest*.

Perverse Influences of Malocclusion.—Irregular teeth result in poor mastication of the food with less saliva than is necessary for digestion; thereby the stomach and the intestines are overworked in trying to digest and absorb the nutritive elements of the food, and the result is poor digestion and increased waste in absorption. In consequence the distributing systems do not carry enough material to the bone and muscle tissues to meet the demand for growth; there is a general lowering of the tone and development of the whole, and the bones and muscles of the jaws and face suffer with the rest, and the teeth become more irregular.—FRANK A. DELABARRE, *Oral Hygiene*.

Preparation of the Mouth for Reception of Restorative Work.—A surgeon would not think of performing an operation unless he had first cleaned up the field and placed the patient in a position to stand the operation. So it should be with a dentist. I think it is the duty of every dentist to refuse to place any restorative work in the mouths of his patients unless they are willing to have their mouths put in a fairly clean and healthy condition. Though the patient may go elsewhere to have his immediate work done, it will only be a short time before he will realize your honesty and return to you.—ROBIN ADAIR, *American Dentist*.

Trigeminal Neuralgia.—The local causes are numerous, but to diminish their influence all that is necessary is to place the patient in suitable hygienic surroundings, after which the local etiological factors are to be considered. After removal of teeth, the condensing periostitis arising in the empty alveolæ may include the nerve endings, and this neuralgia of edentates is rapidly done away with by resection of the alveolar borders. A badly fitting plate of teeth or a tooth with an exposed pulp, a badly fitting artificial eye in contact with the inflamed and painful ocular stump, and the various otitides are all causal factors which should never be ignored.—*New York Medical Journal*.

Suggestions for Mouth Hygiene and Care of the Tooth Brush.—After considerable search for a simple and efficient method of mouth hygiene the following plan seems to solve most difficulties. The patient is advised to keep an approved tooth brush and a salt cellar (preferably aluminum) as his mouth hygiene equipment. After properly brushing his gums and teeth, sufficient salt is sprinkled in a glass of warm water to make a normal salt solution (approximately half a teaspoonful of salt). This is used as a mouth wash. The brush is then held under the running water and cleansed as thoroughly as possible. Salt is then sprinkled upon the brush. The salt is dissolved on the wet brush and penetrates thoroughly to the center of the tufts of the bristles. The brush is then hung in the usual place. When it is again needed, the water will have been evaporated, leaving a deposition of salt crystals in and around every

bristle. Can you imagine germs living in such an environment? Use the brush as it appears, covered with salt, or if too salty knock off the excess salt and apply your favorite powder.

This procedure thoroughly sterilizes and toughens the bristles, can be done without loss of time and provides on the brush an efficient and harmless antiseptic for promoting mouth hygiene.—HUGH W. MACMILLAN, *Dental Items of Interest*.

One Way to Cap a Dental Pulp.—The actual pulp capping is done as follows: A paste is made of oil of cloves and the powder of oxy-phosphate cement. A metallic cap is then made, preferably of irridio-platinum. This cap is made hemispherically and concaved. It may be done with suitable contouring pliers, or by malleting with a round end burnisher into a block of lead. The caved cap is fitted to the bottom of the cavity and of such size and shape that its edges rest in sound dentin, thus bridging over and preventing future pressure upon the underlying pulp.

The concaved hollow in the metallic cap is filled with the oil of cloves paste and placed over the point of suspected exposure (or, as in the case cited, over the actual exposure) and is then protected with a layer of oxy-phosphate mixed to a creamy consistency and flowed over the capping.

This provides the pulp with a metallic, bridge-like protection, and the metallic cap likewise prevents the admixing of the oil of cloves paste with the superimposed oxy-phosphate. It is deemed essential to thus maintain the hardening and sterilizing effect of the oil of cloves against the decalcified dentin left in place.—*Around the Table, Dental Items of Interest*.

The true scientist struggles to emulate Nature even in the minutest details, and just in the proportion as he accomplishes this premise is his success measured.—G. W. TODD, *Dental Items of Interest*.

OUR ARMY AND NAVY

COMPILED BY LELAND BARRETT, D.D.S.

RECENT DECISIONS OF INTEREST

E. L. H.—First lieutenants of the medical corps of the Regular Army and National Guard and those of the dental corps of the Regular Army are promoted after one year's service. There is no law in regard to the promotion of medical officers of the reserves, who are promoted according to individual fitness up to and including the grade of major. Recommendations for promotion are considered by an advisory board in the Surgeon General's office. It is proper for an officer to make application for promotion, which should be addressed, of course, to the chief division surgeon and sent through the immediate commanding officer, which, in your case, would be the officer in command of the organization with which you are serving when you make the application.

J. R. R.—If a dental reserve officer has been in active service for a period of three months he is eligible for promotion upon recommendation, but all such recommendations must go through regular channels and will not be considered otherwise.

R. S. B.—Dental, medical and veterinary students are all in the same class and will be permitted to finish their courses before being called to service.

Army and Navy Register.

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FALLEN AMERICANS TO LIE IN FRANCE

Representative Moore of Pennsylvania told the House on Monday that conditions beyond the control of the American military authorities made it impracticable for the War Department to grant the request of relatives of fallen American soldiers that the bodies be returned to the United States for burial. He read a cablegram from General Pershing saying it was impracticable to embalm bodies in the theater of operations and recommending that the United States Government conform to the customs of the Allies in burying their dead near the field of battle.

* * *

DEATH OF SOLDIERS

Deaths among the expeditionary forces as a result of accidents, suicide, homicidal attack and military execution hereafter will be included in the casualty lists under the heading, "Accidents and Other Causes," Secretary Baker has announced, after consulting his advisers as to whether the exact cause of death should be made public in each case. Officials were unanimously against such action, holding that it

would humiliate unnecessarily the friends and relatives of men who die as a result of their own misconduct.

The War Department in these cases notifies the nearest relative privately that the soldier died on such a date in France, adding that the department regrets to advise against any further inquiry into the cause of death. If the relative insists, however, the cause is given.

* * *

A TIP FROM THE TRENCHES FOR DRAFTED MEN

Many of the drafted men arrive here with odd ideas of the country. If you know any men coming over here tell them not to carry a pound of baggage except absolute necessities. Uncle Sam is a generous outfitter, but they will find the following things of real help here: An illuminated wrist watch, a good fountain pen, two pads of writing paper, a compass, a bottle of tincture of larkspur, plenty of handkerchiefs and socks, and as much candy and tobacco as they think they need. French steel is poor, so bring a few dozen blades for safety razors; also an extra supply of shaving soap and a New Testament. You may scoff at the latter, but ten minutes of shrapnel fire will convert the hardest atheist.

And I might say here that the man who invents cootie-proof underwear for soldiers can easily win the unanimous vote of the army at the next election.—*From a soldier's letter in the Army and Navy Register.*

* * *

CALL FOR ARMY NURSES

Surgeon General Gorgas Saturday called upon the American Red Cross, the chief nurse recruiting agency of the Army, to employ every possible means to increase the enrollment of nurses for immediate assignment to duty. He asked that at least 1,000 nurses a week be enrolled for the next two months.

The increase in the Army, both at home and abroad, has necessitated a proportionate increase in the number of nurses in the service. The Army today is growing faster than the nurse corps is increasing, and as the armies overseas enter the front line trenches in greater numbers the greater will be the need for nurses in the Army nurse corps.

Trained nurses who wish to be of service to their country can do so at once by going to the local office of the Red Cross and making application to join the Army nurse corps. If found satisfactory they will be assigned to duty at once, either in the base hospitals in this country or overseas.

Nurses enrolling in the Army nurse corps are members of the United States Army and work directly under officers of the medical department of the Army.

* * *

RELATIVES OF OFFICERS AND MEN AS WORKERS

On representation of responsible heads of the Red Cross, Y. M. C. A. and other allied bodies who are doing war work in France that they are

unable to obtain a sufficient number of women as workers, the prohibition by the War Department concerning the granting of passports to relatives of officers and men in the United States Army is modified so as to permit the use of sisters of soldiers as workers under the following conditions:

1. The sisters must be duly accredited members of one of the regular authorized organizations.

2. Each must be particularly qualified by training for the position she is to fill.

3. That she is sent to France as a worker and not as a relative.

4. That she will make no effort to visit her relatives in France, whether sick or well.

5. That the organization to which she belongs will make itself responsible for returning her to America in case she violates these rules.

6. That if she marries an officer or a soldier in the American expeditionary forces after her arrival she will automatically be sent back to the United States by the organization in which she is serving.

An agreement has been reached with the heads of the organizations affected to submit to the headquarters of the A. E. F. in France for approval lists showing the numbers they recommend being sent, and those actually sent will therefore be based upon the calls of the heads of these societies in France.—PEYTON C. MARCH, Chief of Staff.

Army and Navy Register.

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WAR-RISK INSURANCE

Insurance applications received from soldiers and sailors by the Bureau of War-Risk Insurance now aggregate more than twenty-five billion dollars, Secretary McAdoo announced today, August 3, 1918.

More than 2,954,609 applications have been received to date for a grand total of \$25,148,118,000.

In the last four days upward of one billion of new insurance was written. The total for July will be close to four billion dollars.

The average amount of insurance applied for per man has been steadily increasing for the last few months and is now about \$8,500. The maximum permitted by the law is \$10,000.

The Bureau of War-Risk Insurance now has more insurance in force by three billion dollars than the ordinary life insurance on the books of all the legal reserve insurance companies of the United States combined.

Persons who have been named as beneficiaries under the war-risk insurance but have not yet received their insurance certificates are reminded that these certificates are not essential to make the insurance protection effective.

The certificate is merely evidence of the existence of the contract of insurance and forms no part thereof. No apprehension should be felt by persons who have not yet received their certificates. They are being

sent forward as rapidly as limited space and an unprecedented onrush of business will permit.

More than 1,800,000 insurance certificates have already been mailed.

The millions of insurance applications received by the bureau are all indexed, classified and held under statistical control so that information on the insurance protection of any person in the Army or Navy can be obtained instantly.

Army and Navy Register.

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DEATH RATE OF WOUNDED

In a statement by the Chief of Staff relative to casualties among the American expeditionary forces in the Marne-Aisne offensive, he states that upon the basis of the officially attested experience of our associates during four years of this war that of wounded soldiers sent to hospitals for treatment fewer than one in twenty die.

Of all the soldiers sent to the hospitals only 45 in every 1,000 die. These include those who die of disease as well as those who die of wounds. Of all soldiers wounded in action more than four-fifths return to service, many of them in less than two months. It is necessary to discharge for physical disability only 14.5 per cent.

These figures are based on an average of both British and French official figures, including both officers and men. The two are averaged together, since American troops are fighting with both the French and the British under conditions which vary. They show:

Returned to service.....	81 % or 810 per 1,000
Discharged from service because of physical disability or other causes..	14.5% or 145 per 1,000
Died of wounds.....	5 % or 45 per 1,000

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STUDENTS ON OVERSEAS DUTY NOT GRANTED FURLOUGH

The Adjutant-General of the Army announces that it is the policy of the War Department not to allow the return of enlisted men from overseas to the United States for the purpose of completing their education. This policy applies to medical, dental and veterinary students.

Journal of the A. M. A.

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NEW REGULATIONS REGARDING THE SERVING OF LIQUOR TO SOLDIERS

It is announced that new regulations have been made relative to serving liquor to soldiers which prevent selling, bartering, giving, serving, or knowingly delivering alcoholic liquor to any officer or member of the military forces within the United States, its territories or possessions or any place under its control, except to medical officers for medicinal purposes.

Journal of the A. M. A.

PHYSICAL RECONSTRUCTION OF SOLDIERS

The number of sick and wounded landed in the United States during the week ending July 19 from the American expeditionary forces was 190. These men were sent to the various Army hospitals where facilities for treatment and physical reconstruction have been provided. The Army appropriation act of July 9 contained several provisions for vocational training. This is in addition to the law empowering the Federal vocational board to provide for rehabilitation of men no longer physically able to perform their military duties. The Army appropriation act provides for "salaries of those necessary as instructors at vocational schools"; "for vocational training, including employment of necessary civilian instructors in important trades related to aviation"; and for the employment of the necessary civilian instructors in the most important trades, for the purchase of carpenters', machinists', plumbers', masons', electricians' and such other tools and equipment as may be required, including machines used in connection with the trades, for the purchase of material and other supplies necessary for instruction and training purposes and the construction of such buildings needed for vocational training in agriculture for shops, storage and shelter of machinery as may be necessary to carry out the provisions of section 27 of the act approved June 3, 1916, authorizing, in addition to the military training of soldiers while in the active service, means for securing an opportunity to study and receive instruction upon educational lines of such character as to increase their military efficiency and enable them to return to civil life better equipped for industrial, commercial and general business occupations, part of this instruction to consist of vocational education either in agriculture or the mechanic arts.

Army and Navy Register.

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Reconstruction work for crippled soldiers, in order that they may be fitted for remunerative occupations and thus become independent wage earners, is engaging various agencies to which *The World* has directed attention. A new one is now added to the list in the form of a clinic, the first of its kind in practical operation. It has been installed in Livingston Place and it is associated with Cornell University Medical College.

The intention, according to the *New York Medical Journal*, is to pave the way for work of the Red Cross Institute for Crippled and Disabled Men by giving special forms of treatment to the wounded which will prevent distortion and deformity as far as possible. Dr. R. Tait Mac-kensie of the University of Pennsylvania has installed there a number of special appliances devised by him as a result of his study in Canadian hospitals, which have been successful in diminishing the untoward result of war wounds.

The Cornell faculty will serve in the clinic, and students of the school may profit by the opportunities for observation. It is expected that through

this and similar agencies thousands of maimed soldiers will be restored to conditions of self-support, thereby maintaining their full status in society.

Daily Paper.

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PHYSICAL DEFECTS OF VOLUNTEERS

A report of the physical examination of 20,000 volunteers by Major Clarence L. Cole, medical corps, U. S. Army, and Capt. E. W. Loonis and First Lieut. E. A. Campbell, of the medical reserve corps, states that fifty per cent of all volunteers have important physical defects. A large number of these men could be cured of their ailments and made available for military service if proper provision had been made for refitting stations. The conclusions of the medical officers show the necessity of physical training and supervision of school children by governmental agencies. Their findings follow:

1. Practically fifty per cent of all candidates volunteering for military service—20,000 men examined—have physical defects which incapacitate for military service entirely or reduce efficiency.

2. The present method of examination requires acceptance of many defective men or rejection of many men who can be made capable of performing military service.

3. Establishment of refitting stations with properly organized staff for medical treatment and military drill would afford time for observation of men before discharge or afford an opportunity for treatment of curable defects.

4. The number of men available for military service would be increased.

5. The military efficiency of the forces would be increased through bringing all men to a higher physical standard.

6. More efficient intensive training could be given at training camps through reducing the number of men admitted to camp hospitals for physical defects existing at the time of enlistment.

7. Many physical defects exist in young men of military age which could have been corrected, by proper inspection and physical development, while the individuals were school children, if provision had been made for such procedure in our public schools.

* * *

GAS MASKS

The gas defense service is now manufacturing about 5,000 horse gas masks per day. These are being sent to France and it is expected that within a short time every horse connected with the American expeditionary forces will be equipped with the new masks.

The new masks have a defensive value considerably greater than any known masks. They can be made more quickly, are more economical and more efficient. They are odorless after being impregnated with

chemicals to neutralize all known gases that would affect horses. So far as is known this can be said of no other mask now being used by any of the enemy armies. A distinct advantage is that the masks can be placed securely on the heads of horses which are not wearing harness. This additional feature will result in the saving of many horses, as it frequently has happened that horses were overcome by gas because they were not wearing harness to which the masks could be attached when the gas came.

The gas defense service has a completely equipped factory for the manufacture of the masks. In less than three weeks a building was selected and the factory was producing masks. The introduction of riveting machinery has done away with the heavy hand sewing of the frame which supports the masks on the faces of the horses. The masks are so constructed that no metal or chemically impregnated parts can chafe the horse.

* * *

OFFICERS' UNIFORMS AT COST

The Military Academy appropriation bill, which passed the Senate, contained this Senate amendment: "That all uniforms, accouterments and equipment required for any officer of the military or naval forces of the United States, including cadets at the Military and Naval Academies, shall be furnished and issued to such officers by the Government at cost price, under the regulations to be prescribed by the Secretary of War and the Secretary of the Navy, and the same shall be similar in quality and price for all officers of the same rank." This amendment is construed by officers who have read it to mean that the Government shall furnish uniform and equipment at the request of officers, but that the latter will not be compelled to purchase exclusively from the Government. To make it obligatory on both sides would necessitate an allowance for each officer, which is impracticable, owing to the varied conditions of service and the difference in the wear. Some officers, for example, feel that they must have three or more uniforms of the same kind, while two are sufficient for others. The privilege of buying from the Government at cost prices will doubtless be welcome, in view of the very high, if not exorbitant, prices charged for uniforms and the necessary accouterments. It is estimated that a saving of thirty to forty per cent will be made in the purchase of the regulation clothing, while for specialties, such as insignia, puttees, braid, etc., the saving will be still greater. It is probable that the uniforms would be made at the Army and Navy clothing factories, and the measurements would be taken by the tailors detailed on board ship and at the camps. Should this amendment remain in the bill after leaving conference and the Government embarks in the business of making uniforms for officers of the military-naval service, it will not mean that commercial military tailors will be driven out of business, for there will still be a large number of officers who prefer to

wear uniforms made by a custom tailor and of a quality of cloth that is superior to that generally carried by the Government.

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157,000 NEGROES IN ARMY

WASHINGTON, June 2.—Close to 157,000 negro soldiers are now in the National Army, according to a statement issued today by the War Department. Of these 1,000 are line officers. There are approximately 250 negro medical officers in the medical and dental reserve corps.

The army now includes two divisions of negro troops, commanded by Major-General C. C. Ballou and Brigadier-General Roy C. Hoffman. These divisions when fully constituted will embrace practically all branches with men technically trained in all branches of scientific work.—*New York Sun*.

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TRENCH MOUTH

LONDON, May 14 (by mail).—Malcolm Ross, the war correspondent with the New Zealand forces, in a review of the work of the dental corps raised by the Dominion, says:

"We have trench mouth, just as we have trench feet. Otherwise known as ulcero-membranous stomatitis, or Vincent's disease, it has for some considerable time now engaged the attention of both the medical and dental services.

"The result of a bacillus that causes ulceration and bleeding of the gums, it occurs on the German as well as on our side of the war zone. A satisfactory method of treatment has been discovered—the painting of the gums with salvarsan or an arsenical solution—and a cure is generally effected within two or three weeks' time.

"The Germans credited their war bread as one of the contributory causes—a cause that up to the present is absent from the British war zone."

* * *

SOURCE OF SURGICAL INSTRUMENTS

The military-naval medical authorities are encountering, as they anticipated, great difficulty in obtaining instruments and appliances for the use of surgeons in the service. There has been a peculiar situation in regard to surgical instruments because of the fact that most of our instruments had been imported from Germany before the war. Efforts were promptly made to obtain this material from American manufacturers, but their resources were not sufficient to meet the demands. Therefore the Army medical department is obtaining certain instruments from Japanese sources. Some progress has also been made in arousing interest on the part of firms which have never made instruments in this country, notably those who have hitherto made cutlery and scissors, but with all of this available and prospective opportunities it is apprehended that it will be exceedingly difficult to obtain the instruments in the quantities necessary

to meet the medical officers' requisitions, which are coming from France in increasing volume.

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REWARD FOR INFORMATION ABOUT HUNS

Rear Admiral Usher, commanding the third naval district, has made the following announcement:

"The Commandant Third Naval District, No. 280 Broadway, New York, has been authorized to pay \$1,000 reward to any person who furnishes authentic information of any actual submarine base, reserving the right to decide who is entitled to such reward and to apportion the reward if two or more persons find such information."

* * *

NAVAL DENTAL CORPS

The provision for the naval dental corps as finally agreed to by the Senate and House limits the rank of dental officers to that of lieutenant commander instead of commander, as provided in the Senate amendment, and strikes out the provision requiring confirmation of appointments. While the rank is limited to lieutenant commander, provision is made for pay and allowances to the rank of captain and commander. This was done to prevent a conflict in authority. This meets the wishes of the Secretary of the Navy, who made the following statement concerning the proposed legislation:

The appropriation bill, as it now stands, provides roughly for 13 dentists with the rank of commander. The department believes that dental officers should not be commissioned in a grade above that of dental surgeons with the rank of lieutenant commander, for the reason that it now has no billets, nor can it foresee any billets in the future in which a dentist of such high rank can be employed, certainly not to the number of 13. It is the policy of the department to give increase in rank only when such is necessary to facilitate command and administration for the purposes of war or preparation for war, and never as a matter of personal reward. Its recommendations to Congress in the matter of rank have been on this ground solely. It, however, believes that dental surgeons of long service should be permitted to have an increase of pay up to and including that given to a captain in the Navy.—*Army and Navy Register*.

* * *

EXAMINATION FOR NAVAL DENTISTS

Examinations were begun this week, June 29, to fill prospective vacancies in the Naval dental reserve corps, due to the increases allowed in the current appropriation bill. These examinations were held in Washington, New York, Philadelphia, Norfolk, Great Lakes and San Francisco. The complement of the Naval dental corps is 1 to 1,000 of the total personnel. Over 300 are allowed at present and when the Navy bill passes over 100 additional vacancies will be created. The present examinations are for the purpose of making appointments in the reserve only, the minimum age

limit for which is 21 years. An examination for the regular service was held in May, and another will be held some time in October.

* * *

APPOINTMENTS IN NAVAL DENTAL CORPS

As a result of the recent examinations held at the Naval Medical School, Washington, twenty-one candidates were found qualified for appointment in the Naval Dental Corps. Commission in the regular Navy will be issued to those at the top of the list, and when all vacancies in the regular corps are filled, the remaining successful candidates will be issued temporary appointments. The dentists who passed the examinations are, in the order of their standing: E. R. Tilley, Washington, D. C.; H. A. White, Jamestown, N. Y.; E. L. Walter, Washington, D. C.; F. D. Clancy, Framingham, Mass.; E. G. Hoylman, Indianola, Neb.; H. B. Duncan, Freehold, N. J.; J. A. Flynn, Youngstown, Ohio; E. H. Brown, Trenton, N. J.; E. H. Zimmer, Seaton, Ill.; A. L. Burleigh, Plattsburgh, N. Y.; P. B. Maskrey, Martins Ferry, Ohio; A. W. Blum, Chicago; A. H. Yando, Fitchburg, Mass.; C. H. Nelson, Jamestown, N. Y.; R. E. Dickson, West Somerville, Mass.; J. A. Kelly, Boston, Mass.; C. C. Jones, Cisco, Texas; J. E. Morgan, Washington, D. C.; R. Schmucker, Philadelphia, Pa.; J. F. Quinn, New Haven, Conn., and A. Smith, New Orleans, La.

Army and Navy Register.

* * *

DEATH OF DENTAL SURGEON OSBORNE

The Navy Department has been advised of the death of Dental Surgeon Weeden Edward Osborne, U. S. Navy, who was killed in action in France, June 6, while attached to the Marines serving with the American Expeditionary Force.

The Distinguished Service Cross was posthumously awarded Dental Surgeon Osborne by the commander-in-chief of the Expeditionary Force with the following notation in official orders:

"Dental Surgeon Weeden D. Osborne, U. S. N. During the advance on Bouresches, France, on Friday, April 6, 1918, at great risk of his life, performed heroic deeds in aiding the wounded. He was struck by a shell while carrying an officer to a place of safety."

Dr. Osborne, who had been with the Marines at the front only a few days when the action at Bouresches took place, went into the zone of fire time and again to rescue wounded. He went to the aid of a wounded officer and had succeeded in carrying him almost out of the range of fire when a shell struck, killing both Osborne and the officer. In reporting his death, his commanding officer wrote: "Having joined this regiment but a few days before, and new to the service, he displayed heroism worthy of its best traditions."

Dental Surgeon Osborne was born in Chicago, November 13, 1892. On May 8, 1917, he was appointed a dental surgeon in the Navy, and

served at the Navy Yard, Boston, from June 5, 1917, to December 13, 1917, when he was detached and assigned to duty on the Alabama. On March 30, 1918, he was ordered to report to the commanding officer of a regiment of Marines, with the American Expeditionary Force in France, and was serving with this regiment at the time of his death. Next of kin, Elizabeth Osborne, sister, Chicago, Ill.

Army and Navy Register.

* * *

AMERICAN SURGEONS DECORATED

Dr. W. D. Carlyle, a dentist of Salem, Ore., and at present on duty with the Y. M. C. A., Russian unit in France, was recently decorated with the Order of Stanislaus for bravery in caring for wounded.

Journal of the A. M. A.

* * *

Another dental officer cited for bravery was Dental Surgeon Alexander Gordon Lyle, a Massachusetts man, graduated from the Baltimore College of Dental Surgery. He went "over the top" in the face of fire, stopped a hemorrhage from a shell wound in the neck of a Sergeant of Marines, and then dragged him back into the trench and out of danger, thus saving the man's life.

Dental Items of Interest.

* * *

Lieut.-Col. Mortimer Sanderson, Dental Corps, U. S. Army, died at Camp Deming, N. Mex., from mastoiditis on August 2. He was born in New York City in 1886 and was educated in the public schools, after which he studied dentistry at the University of Pennsylvania. Five years ago he became a dentist in the Army with the rank of lieutenant. He saw service in the Philippines and was on the Mexican border during the mobilization of American troops there. His father is John R. Sanderson of 132 St. Marks place, Brooklyn. Lieut.-Col. Sanderson is survived by his wife and three children. The body was taken to New York, where a military funeral was held at the Campbell funeral church, Broadway and Sixty-sixth street.

Army and Navy Register.

* * *

ENOUGH ARMY DENTISTS

The dental requirements of an army of more than 5,000,000 men can now be met by the present force of the Dental Corps of the American Army. Examinations for dental officers have been closed, and no further additions will be made to the corps for at least six months. At the time the United States declared a state of war to exist between this country and Germany the total number of dental officers was 58. The present force numbers 5,810. Commissions were offered to 5,467 dentists in all parts of the country, and all but 271 were accepted, a percentage of 95.1. A school for dental instruction has been started at Fort Oglethorpe, Ga.

Eighty-five dental officers are assigned each month to take the two months' course. The first month is given over to 180 hours of general military instruction and training and the second to 70 hours' special military training and 100 hours devoted to professional subjects that have a definite relation to general practice of dentistry as it should be conducted in the Army. Enlisted men are sent to the school for a similar period of training, their course also consisting of a month each of military training and of professional subjects. Enlisted men are selected from dental students, and the instruction they receive at the school is for the purpose of fitting them as dental assistants.

Special dental infirmaries have been established in the camps and cantonments in this country to which every newly inducted soldier is sent for examination shortly after arrival in the camp. In those cases where men need attention it is given. The average number of tooth fillings is from 225,000 to 250,000 a month. This figure does not include the examinations, treatments, extraction, or crown, bridge and plate work. The practice followed in the camps is to first give treatment to those cases that require immediate attention. Special attention is paid in determining the number of chronic infections associated with teeth. It has been found that a number of diseases incapacitating men for military service are traceable to chronic infections about the teeth. Dental inspectors are constantly visiting camps and cantonments to inspect work done by the camp dentists in order to determine if the dental officers are competent, are correctly assigned, and to report on the general efficiency of the units. The same thorough care that is given to the men in this country is also given to the men in France. With each base, general, or evacuation hospital there is attached a specialist in plastic surgery to correct deformities to face and jaws. Dental surgeons who have been specially trained in this class of work are also assigned to such hospitals.

Army and Navy Register.

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On June 1st there were 209 officers in the regular Dental Corps. In addition to this there were 5,291 commissioned in the reserve corps and 257 in the National Guard, of whom about 2,000 were on duty.

* * *

ORDERS AND APPOINTMENTS

DENTAL CORPS

May 18, 1918

Maj. Richard B. Clark to Louisville, Ky., Camp Zachary Taylor, for temporary duty in the base hospital.

May 25, 1918

The following to Fort Oglethorpe for course of instruction and return to their stations: Lieut. Cols. Harold O. Scott and Frank P. Stone.

1st Lieut. Robert L. Strickland from Fort Oglethorpe, Ga., to Garden City, N. Y., aeronautical general supply depot, for duty.

1st Lieut. Arthur T. Burchill from duty at Fort Oglethorpe to Charlotte, N. C., Camp Greene, for duty with 3d motor mechanics regiment.

1st Lieut. James B. Manning from Fort Oglethorpe to West Point, Miss., aviation camp, for duty.

1st Lieut. Campbell H. Glascock from Fort Oglethorpe to duty at signal corps aviation mechanics' training school, Minneapolis, Minn.

1st Lieut. James A. Curtis, Jr., from Fort Oglethorpe to Camp Greene, N. C., for temporary duty in base hospital.

1st Lieut. Neil J. McCollum from Fort Oglethorpe to Camp Greene, N. C., for duty with 4th motor mechanic regiment.

1st Lieut. William H. Hoblitzell from Fort Oglethorpe to Camp Devens, Mass., for duty.

The following from duty at Fort Oglethorpe to Waco, Tex., aviation mobilization camp, for duty: 1st Lieuts. Lewis W. Maly, William F. Scheumann, and William B. Stewart.

June 1, 1918

Col. George L. Mason from duties at Camp Dix, N. J., and will report at that camp as camp dental surgeon.

Lieut. Col. Frank L. E. Ladham from present duties at Camp Meade, Md., and report at that camp for duty as camp dental surgeon.

June 8, 1918

The following from his present duties at camps specified and report there for duty as camp dental surgeon: Col. Aiden Carpenter, Camp Travis, Tex.; Col. Frank W. Wolven, Camp Lewis, Wash.; Lieut. Col. Minot E. Scott, Camp McClellan, Ala.; Maj. John L. Shock, Camp Devens, Mass.; Lieut. Col. Wm. A. Squires, Camp Sheridan, Ala.; Maj. Benjamin C. Warfield, Camp Custer, Mich.

June 15, 1918

Maj. James G. Morningstar from present duties at Camp Bowie, Tex., to Camp Gordon, Ga., for duty as camp dental surgeon.

Maj. Wm. Mann from present duties at Camp Zachary Taylor, Ky., to duty as camp dental surgeon.

June 22, 1918

Col. Franklin F. Wing from present duties at headquarters Western Department, and to duty as Western Department dental surgeon.

Maj. Bruce H. Roberts from duty at Columbus Barracks, Fort Sam Houston, for duty with evacuation hospital 17.

1st Lieut. Roy C. Starr from duty at Camp Dix, N. J., to Deming, N. M., Camp Cody, for duty.

1st Lieut. Earp T. Dickman honorably discharged.

July 6, 1918

Maj. Bruce H. Roberts from duties with base hospital 2, Fort Bliss, to Fort Sam Houston for duty with evacuation hospital 17.

1st Lieut. Wm. J. R. Akeroyd from duties at Camp Zachary Taylor, Ky., to duty with evacuation hospital 18, that camp.

1st Lieut. Samuel J. Lewis from duties at Camp Meade, Md., to Alexandria, La., Camp Beauregard, for duty with base hospital 102.

July 20, 1918

1st Lieut. James E. Dean from duties at balloon school, Fort Omaha, to Alessandro, Cal., aviation school, for duty.

Aug. 10, 1918

Herms to Rockford, Ill., Camp Grant, for duty.
 ng as first lieutenants in dental corps, Regular Army,
 J. Denholm and Lieut. Harry Holmes, dental reserve
 Harold Jensen and Edward W. Blurock. Lieut. Daniel
 eserve corps; Lieut. Thomas W. Deyton, dental corps,
 James B. Mann, dental corps, National Army; Lieuts.
 Babbitt and Judge W. Fowler, dental reserve corps;
 e Archie T. McGuinness, medical department; Carl
 nnelly; Capt. Merie W. Catterlin, Lieut. Thomas M.
 kson and Lieut. Chester B. Parkinson, dental reserve
 E. Guthrie, dental corps, National Army; Capt. James
 rps.

al corps, recently appointed from dental corps, Na-
 uty at places specified: 1st Lieut. Herbert E. Guthrie,
 1st Lieut. James B. Mann, medical officers' training

DENTAL RESERVE CORPS

May 18, 1918

The following appointments in dental reserve corps announced: To be cap-
 tains: 1st Lieuts. Fred C. Allender, Isaac H. Archer, Egbert E. Baker, Francis

A. Boylan, Roscoe Bristow, Carver R. Brown, Rex P. W. Capwell, Wm. Z. Carroll, Owen L. Chesnutt, Edward E. Courtright, George N. Frost, Robert L. Hart, Roy Hudson, Richard C. Kiebler, Paul K. McGee, Leon M. Muedeking, Edwin J. T. Simon, Wm. L. Smith, Clarence M. Van De Water, George S. F. Waldo, Clarke B. Weeks, Joseph P. Werrick, Odon J. Wilda and Alex J. Zimmer.

May 25, 1918

The following appointments in dental reserve corps announced: To be captains, 1st Lieuts. James E. Bailey, Wm. J. Barto, Howard Bock, Joseph L. Brown, Roy D. Gabbert, Joseph W. Golding, Henry L. Grant, Howard A. Hale, Jay M. Hisey, John O. Lessig, Clayton A. Patterson, Charles P. Shewey and Charles W. A. Spies, dental reserve corps.

Capt. Harry M. Trafford to Montgomery, Ala., Camp Sheridan, for duty in base hospital.

Capt. Max C. Frazier to Washington for duty in Army dispensary.

The following appointments announced:

To be captains: 1st Lieuts. Ralph Burkhart, Samuel B. Ginsberg, Guy R. Harrison, Leonard J. Heiman, Clarence B. Laffin, Cameron E. Lane, Jay H. Lee, John S. Owens, William E. Paul, Merton M. Postle, James H. Stacey, LeRoy Tileston, George E. Walker, and Raymond LeR. White.

June 1, 1918

Maj. Henry W. Rich to Camp Pike, Ark., for duty.

Maj. Oscar LeR. Whitson to base hospital, Fort Riley, for duty.

The following appointments in dental reserve corps announced: To be Captains—1st Lieuts. Thomas Clifton F. Shirley and Robert S. Catheron, dental reserve corps.

June 8, 1918

Appointment of 1st Lieut. Harry A. Tuckey to captain announced.

The following appointments in dental reserve corps announced: To be Major—Capt. Max C. Frazier. To be Captains—1st Lieuts. James T. Conner, Harry B. Riley, Leo B. Muzzy and Howard R. Dingler.

June 15, 1918

Maj. Grove W. Dunham at Camp Custer, Mich., to duty as acting division dental surgeon.

The appointments of following in dental reserve corps announced: To be Captains—1st Lieuts. Louis G. Prendergast, Donald M. Gallie, Jr., and Conrad E. Mortensen, dental reserve corps.

June 22, 1918

Maj. Joseph A. Boarts to Columbia, S. C., Camp Jackson, for duty with evacuation hospital 14.

Maj. John McD. Eveleth to Camp Greene, N. C., for duty with base hospital 54.

The appointment of Capt. Richard C. Kiebler, dental reserve corps, to major, dental reserve corps, announced.

July 6, 1918

Appointment of following in dental reserve corps announced: To be captains—1st Lieuts. Howard A. Reid, Fred L. McAninch, Arthur H. Nobs, Henry O. Lineberger, Carlton B. Leighton, Walter E. Miller, Pope L. Marshall, Francis E. Derham, Solomon J. Z. Gantz, Henry H. Braxton, Frank H. Cushman, Albert B. Crutcher, Carl M. Holland, Emory O. West, Fielding M. Wilhite, John B. Williams, Robert M. Schell, Thomas H. Tye, George K. Patterson, Courtney J. Murphy, Alexander W. McClean, Nealie E. Ross, Robert A. Adkins, James H. Johnson, Matthew A. Boykin, Frampton W. Farmer, John H. Davis, Edward M. Atkinson, Harry B. Laird, Neal D. Williams, Wm. D. Rush, Elliott H. Rowland, Walter E. Lowrie, George G. Starke, Homer T. Kemper, John L. Remsen, Harvey B. Haselton, Max F. Gruber, Fred A. Beaty, James C. Campbell and Clarence A. Flanagan.

July 13, 1918

Appointment April 24 of 1st Lieut. Albert W. Marshall to major announced.

July 20, 1918

Appointments of following in dental reserve corps announced: To be Majors—Capts. Wm. P. Delafield and Edward E. P. Sleppy, dental reserve corps. To be Captain—1st Lieut. John R. Ricker, dental reserve corps.

July 27, 1918

Appointment of following in dental reserve corps announced: To be Captains—1st Lieuts. Laurence E. Aldrich, John D. Albin, Clarence S. Delong, Robert L. Donaldson, Henry S. Davis, Howard W. Geiger, Frank F. Happy, Wm. H. Hatcher, Chauncey H. Jones, Ralph O. Leonard, Edwin J. Nestler, Wm. T.

Roberts, Howard E. Summers, Herbert J. Schlewets, Roy G. Strickler, Harold J. Thorne, George P. Taylor, Oscar W. Thompson, Peter J. Wumkes and Joseph H. Wilson, dental reserve corps.

Aug. 10, 1918

Maj. John Vose to Des Moines, Iowa, Camp Dodge, for duty with base hospital 88.

Appointment of following in
1st Lieut. Samuel W. Hussey, de
dental reserve corps. To be C
W. Leach, George W. Middleto
Barr, Harry T. Bledsoe, Marti
Christiansen, Joseph H. Hurdle
Melvin, Wm. W. Oursler, Rober
Charles L. Appleby, Troy L. B
F. Murphy, George J. Stephens
dental reserve corps.

CURRENT NEWS

COMPILED BY LELAND BARRETT, D.D.S.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS

COMMUNICATION FROM THE PRESIDENT

There are a few points about free dental service that should be emphasized at this time.

1. The League requests its members to give each drafted man *one hour* of free dental service. This should be given without question as to ability to pay.

When the hour has been completed, the dentist is at liberty to inquire as to the ability of the registrant to pay a fee to have the work completed, should additional service be required. Should he prove himself worthy of further free service, the dentist continues such service in the *name of the League*.

Such service only, is reported to the League.

2. All dental work for which a fee is received from the drafted man is *not Preparedness League work*.

Such service must not be reported to the League.

FREE is a word that cannot be qualified and admits of no variation. The charge of a single farthing nullifies the spirit of the League through which free dental service is given.

I commend to the attention of every member of the League the following letter, which concisely covers the situation and may be considered a rule to follow. It is most essential that we conform in every particular to the ruling of the War Department:

WAR DEPARTMENT
OFFICE OF THE PROVOST MARSHAL GENERAL
Washington

June 8, 1918.

Dr. J. W. Beach,
President Preparedness League of American Dentists,
Buffalo, N. Y.

Dear Sir:

This is to acknowledge your favor of June 4th, and to say that, it together with enclosures, has been carefully noted. This office very much appreciates the incalculable value of the work your League is doing and the prompt and full co-operation of its officers with the Government.

In the course of the enormous work you are doing, misunderstandings have necessarily arisen between dentists and the registrants for whom they were voluntarily working, but such misunderstandings are by no means confined to the profession of dentistry. We realize that some who are able and ought to pay for dental services rendered will try to get service without payment. This, of course, is not contemplated by any fair-minded person, much less by the Government. Registrants who are able to pay for the necessary work ought to do so, and those demanding very expensive work, or more than is necessary to fit them for military service, ought at least to pay the expense.

In order, however, to avoid any misunderstandings, and to prevent any possibility of abuse or scandal, I think there should be no attempt whatever to differentiate between those who may and those who may not be able to pay, so far as concerns the actual work necessary to fit for military duty. I think the rule ought to be clearly and fully announced, that *any registrant who is sent to one of your members and presents himself for treatment comes as a result of a statement that the work is to be done without cost to him*, just as if he were already in the service and were being treated by Army surgeons, and is to be given such treatment as may be necessary, without any thought or inquiry as to whether or not he is able to pay. If he voluntarily and without demand offers to pay what he can, or if he requests additional treatment beyond what is absolutely essential, that is a matter of agreement between him and the dentist.

I hope I have made myself perfectly clear, and am sure that you agree with the proposition I have advanced.

I hope that you will convey to the members of the League the assurance that the value of the magnificent, patriotic work it has undertaken and is performing is fully appreciated not only by this office and by the War Department, but also by all our people to whom it is day by day becoming better known.

Very truly yours,

(Signed) J. S. EASBY-SMITH,

Lieut.-Colonel, N. A.,

Chief, Law Division.

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League Buttons.—We again urge all members to wear the league button as an indication that they are actively engaged in preparing our drafted men for service. Those not having the button may secure one by sending twenty-five cents to the treasurer, Dr. L. M. Waugh, 576 Fifth avenue, New York, N. Y.

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The League Study Course.—The league study course is designed for the mature practitioner to prepare him to give adequate service to our soldiers who have been injured in battle. Many thousands will return

needing our best care, therefore it is our duty and privilege to give every assistance possible in this direction. The course will be practical in character and approved by our best authorities. Information may be obtained by addressing the office of the president, 131 Allen street, Buffalo, New York.

* * * * *

Lantern Slides.—The league has prepared 25 sets of slides which have been distributed to the different state directors to be used by sectional units and dental societies in general. The public also may find much of interest in viewing these pictures. Each set is practically divided into two parts, one set arranged by Major Heckard, comprising nearly 90 slides and traces the plans and development of the great work of caring for the drafted men. The evolution of the different form cards together with their application is graphically depicted and is of especial benefit to directors and members of the league generally. Every district director should show these slides to his workers.

The second set of about 35 slides was arranged by Dr. J. W. Beach and aside from conveying general information of the league and its work, gives special emphasis to the wonderful dental motor car of the league in a series of most interesting pictures. These are available through the state directors. There is a lecture in synopsis form accompanying each set of slides.

DR. J. W. BEACH, *President.*

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The Post Office Department has rescinded the franking privilege of the Liberty Loan Committee, the War Savings Stamp Committee and other semi-official organizations which are raising money for the Government.

They had also rescinded the franking privilege of the Preparedness League. We have, however, been able to secure permission to continue franking form 3-C and form 3-D cards. Form 18's and any letters or other communications relative to Preparedness League work, either between the State Directors or other officers, must hereafter be sent out with the regular postage.

The stationery on hand in the way of franked envelopes can be used, but the necessary postage must be applied to those envelopes.

Lieut. J. V. Gentilly has been assigned by the Surgeon-General's office to headquarters of the Preparedness League.

* * * * *

On August 19, 1917, with the approval of the Surgeon-General, permission was sought from the Provost Marshal-General to secure franking privileges for the Preparedness League of American Dentists, and concurrence in a plan which would make it possible for all men who had been accepted for general military service to be advised to appear before the members of that organization to have any urgently needed dental

operations performed, without expense to themselves or to the Government, previous to their arrival at camp. This work was considered imperative at that time, for the reason there was being assigned only one dentist per thousand of the total strength of the Army, and also the manufacturers were unable to meet the excessive demands made upon them in the early days of the war.

The Provost Marshal-General heartily approved of the proposal made, and gave every assistance possible, even urging by personal letter the Governor of each State to inform all Local and Medical Advisory Boards that he approved of their appointing a dentist for volunteer service on each board to aid in the physical examinations of all men called before them, and expressed it as his opinion that the patriotic service offered by the dental profession would be of great value not only for the comfort, but to the efficiency of the National Army.

Following the Department's approval, a Dental Reserve Corps Officer was assigned to the Preparedness League Headquarters, in New York, who, in coöperation with the officers of that organization, has obtained splendid results. The membership of this organization has increased in the past year from about 4,000 to 16,000, and as a concrete example of what the officers and members have contributed in the form of gratuitous service for men who have been accepted for general military service, it is here recorded that they have furnished the material and performed 375,000 gratuitous operations for men selected for general military service. It should also be stated that through their activity, three dental motor car ambulances have been presented to the Government, and another one is to be tendered in the immediate future.

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From Colonel Logan's address, at the National Convention, August 6th, 1918, relative to the activities of P. L. A. D.:

In reference to the dental profession continuing to render free dental service to the selective service men, the opinion is here expressed, with the approval of the Surgeon-General's Office, that since there are now especially constructed dental unit buildings in all the camps, and that full dental equipment is available, as a result of the earnest and efficient coöperation on the part of the dental manufacturers, the Department does not feel that the same imperative need now exists that pertained last autumn for the continuation of all the various types of dental operations that have been performed in the past by the members of the Preparedness League, for the reason that the Army Dental Service has reached the point where it can now cope with the dental problem after the selective service man arrives at his camp. However, the Surgeon-General's office would be pleased if the members of the profession, through the Preparedness League, would continue their volunteer service on the Local and Medical Advisory Boards, and, thereby prevent the acceptance for general military service of men who are not dentally fit. The hope is

expressed by decreasing the number of filling operations, there will be a corresponding increase in the number of registrants made dentally fit gratuitously, who have been physically rejected wholly because of dental deficiencies.

In addition, their services are urgently sought under the plan already adopted by this splendid organization, to have all hopelessly diseased roots and teeth removed from the mouths of those men who have been accepted for general military service previous to their arrival at camp, for if this can be accomplished, a valuable service will be rendered, and the health of the soldier will be improved, as there is great danger in the early days of military training of the development of those systemic diseases which have their origin from these focal infections.

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The following figures show the amount of work done by the Preparedness League to August 1st, 1918:

Men examined	131,594
Men worked for and reported by card.....	105,174
Fillings inserted	273,493
Teeth extracted	97,123
Plates made	754
Crowns made.....	3,324
Crowns and bridges.....	170
Bridges	1,338
Prophylaxis treatments	59,827
Diseased teeth treated.....	2,741
Miscellaneous operations.....	48,550
Total operations performed, including dental colleges.....	513,030

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At the annual meeting of the Preparedness League of American Dentists, held at the Auditorium Hotel, Chicago, on August 9th, one of the important events transpiring was the resignation of Dr. Charles F. Ash, as director-general of the League, which necessitated the election of a successor in the person of our well-known friend, Dr. William Dwight Tracy, of New York, who has already assumed charge of headquarters, at 50 East Forty-second street, New York.

Another event of the meeting was an address by Dr. Arthur N. Davis, who practised in Berlin for eighteen years and who returned to America only a few months ago. Dr. Davis gave a most interesting description of his experiences in Germany after the war began and during the four years progress of the war, before he returned to this country. It was a pleasure to listen to the story as he told it, and to get, at first hand, the impressions of one who had been in such close touch with the people who precipitated the terrible World War that is now raging.

Lieut.-Col. W. H. G. Logan, who is at the head of the Dental Corps of the United States Army, addressing the National Dental Association as its president on August 6th, commended the volunteer work of the P. L. of A. D. in dentally preparing the future soldiers for their camp life, and thus partially at least, relieving the pressure of work upon the army dentist. He also called the attention of the League members to the fact that they had a large opportunity for rendering a service of especial value by restoring to dental efficiency those registrants who are physically fit in every way except for a dental deficiency. These registrants are held in Group C, and can be brought up to the minimum dental requirement of the Selective Service Regulations in many instances by the insertion of a small fixed bridge when they would immediately be transferred into Class 1 A, and become available for General Military Service.

Director Tracy informed the writer that details of a plan, based on Col. Logan's suggestion, are being formulated and that each dentist may be asked to contribute at least one bridge each month.

L. BARRETT.

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NEW YORK CITY WEST SIDE Y. M. C. A. TAKES OVER DENTAL LABORATORY TO TRAIN WAR-MAIMED MEN

Many of the men maimed in battle for democracy will be trained back to usefulness and given a trade in a dental technical school just acquired by the New York City West Side Y. M. C. A. Announcement has been made that the Dental Laboratories, Incorporated, a school for mechanical dentistry, has been acquired by the Y. M. C. A. The school was started some three years ago by George and Nicholas Bonsignore, young Italians, with vision but limited capital. The school grew until they could not handle it without financial reorganization, for which the time seemed unpropitious, therefore they went to the Y. M. C. A., which has several technical schools, and a deal was consummated which put the Red Triangle over the door of this additional school. The Bonsignore Brothers will remain in charge of the teaching and F. M. Babcock will be in charge of the business end. Mr. Babcock was at one time private secretary for John Wanamaker.

There was a time when the dentist did all of his mechanical work including the making of plates, but nowadays much of the mechanical work is sent to laboratories while the dentist confines his practice to operative work. As the laboratory work is bench work chiefly, the men who come back from the war minus a leg or otherwise maimed, provided they have two good hands with which to work, will be able to acquire proficiency in this trade in which only a nimble brain and fingers are necessary. Mr. E. L. Wertheim, Y. M. C. A. educational director, says that the new school is a natural addition to the technical departments of the Y. M. C. A. He believes that the increased interest in the care of the teeth means a rapid expansion in dentistry and therefore an added need for mechanical dentists.

PROCAIN AND NOVOCAIN IDENTICAL

To the Editor: It appears that in certain quarters the attitude is taken that the local anesthetic sold as procain is not identical with that marketed as novocain. The Subcommittee on Synthetic Drugs of the National Research Council believes it important that this misunderstanding should be corrected and hence offers the following explanation:

The monohydrochlorid of para-amino-benzoyldiethyl-aminoethanol, which was formerly made in Germany by the Farbwerke, vorm. Meister, Lucius and Bruening, Hoechst A. M., and sold under the trademarked name "Novocaine," is now manufactured in the United States. Under the provisions of the Trading with the Enemy Act, the Federal Trade Commission has taken over the patent that gave monopoly for the manufacture and sale of the local anesthetic to the German corporation, and has issued licenses to American concerns for the manufacture of the product. This license makes it a condition that the product first introduced under the proprietary name "Novocaine" shall be called procaine, and that it shall in every way be made the same as the article formerly obtained from Germany. To insure this identity with the German novocain, the Federal Trade Commission has submitted the product of each firm licensed to the A. M. A. Chemical Laboratory to establish its chemical identity and purity, and to the Cornell pharmacologist, Dr. R. A. Hatcher, to determine that it was not unduly toxic.

So far the following firms have been licensed to manufacture and sell procain: The Abbott Laboratories, Ravenswood, Chicago; Farbwerke-Hoechst Company, New York; Rector Chemical Company, Inc., New York, and Calco Chemical Company, Bound Brook, N. J. Of these, the first three firms are offering their products for sale at this time, and have secured their admission to New and Nonofficial Remedies as brands of procain which comply with the New and Nonofficial Remedies standards.

While all firms are required to sell their product under the official name "Procaine," the Farbwerke-Hoechst Company is permitted to use the trade designation "Novocaine" in addition, since it holds the right to this designation by virtue of trademark registration.

In conclusion: Procain is identical with the substance first introduced as novocain. In the interest of rational nomenclature, the first term should be used in prescriptions and scientific contributions. If it is deemed necessary to designate the product of a particular firm, this may be done by writing Procaine-Abbott, Procaine-Rector, or Procaine-Farbwerke (or Procaine [Novocaine brand]).

JULIUS STIEGLITZ, Chicago.

Chairman Subcommittee on Synthetic Drugs, National Research Council.

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SUBSTITUTE FOODS IN GERMANY

Schwalbe, the editor of the *Deutsche medizinische Wochenschrift*, has been appealing to the authorities to protect the public against injury from

the newly invented substitutes for the ordinary foodstuffs. He demands that they be tested and not be allowed to be sold without an official permit. The Kriegsernährungsamt gives out information concerning them to the wholesalers and to the chemists engaged in food inspection, but this is no protection to the public, as the information in question is strictly confidential. The few fines imposed for serious infractions of the regulations in this line are of no help in the matter as the profits for the producers far outweigh the small fines imposed. The *Nederlandsch Tijdschrift*, in citing his communication on the subject, remarks that the judges, besides, are able to rely on the assertion of an expert authority, Dr. I. Hoppe, to the effect that a substitute article does not have to possess the nutritional value of the article for which it is a substitute. He says, "The opposite principle, namely, that we can substitute everything, is juster, and has besides high moral value, as it improves the morale, renders it easier to hold out, and guarantees victory." The German Association of Food Experts endorses this absurd principle. The insignificant influence of threats of punishment is seen in the number of these substitutes on the market. In November the figure had reached 7,000. Some of the German states have already introduced certain restrictions along the lines advocated by Schwalbe and also by Neustätter. In Baden, none of the substitute articles may be offered for sale without a permit. A sample of the article has to be presented with a certificate from some official inspecting board in regard to the composition of the article, or a fee of 50 marks be paid in case the investigation has to be done anew. The decision, whether favorable or unfavorable, is then published in the *Karlsruher Zeitung* at the expense of the applicant. The latter may then appeal to the Minister of the Interior. Non-compliance with the regulations may entail a penalty of six months' imprisonment or a fine, with exclusion from further trading. Similar regulations are in force in Württemberg, Saxony and other states. In Saxony the net weight and the price of the article have to be specified on the label. It is further decreed that no use for advertising purposes may be made of the permission to sell the article. The Bundesrath has further regulated the sale of bouillon cubes. They may be sold as *Fleischbrühe*, "meat soup" or "bouillon," without the addition of the term "substitute," only when they contain meat extract or evaporated bouillon, with salt, fat and extracts of vegetables, with at least 0.45 per cent creatinin, and 3 per cent nitrogen, and not more than 65 per cent cooking salt, with no sugar or syrup. Even when labeled "substitute bouillon," they must contain at least 2 per cent nitrogen and not more than 70 per cent salt, without any sugar or syrup.

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WHITNEY MEASURE TO CONTROL VENEREAL DISEASES

NEW YORK.—The Whitney bill, said to be the most drastic health measure ever enacted by any state, went into effect May 5. The bill was passed at the request of the Federal Government and is designed to pro-

fect soldiers and sailors against venereal diseases. This bill provides for the arrest and detention of persons afflicted with venereal disease during treatment. The enforcing of the law is placed mainly in the hands of local health boards. The New York City Health Department has taken immediate steps to assist in the enforcement of this law by sending health department officials to the night court. All prisoners will be held for diagnosis. After that those found to be suffering from venereal disease will be held in city hospitals, or may be released at the discretion of the health authorities on guarantees that they will receive treatment. Men as well as women are being arrested. The state health department, in co-operation with the Federal authorities, has outlined an extensive program, which, in addition to necessary educational features for both physicians and the public, includes provisions for increased diagnostic facilities, for the manufacture and free distribution of arsphenamin (salvarsan) or one of its substitutes, for free advice and treatment of infected persons unable to pay for it, and for the taking of steps to secure greater hospital facilities for those in need of such care or for those who would otherwise be a danger to the community.

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NEW VENEREAL DISEASE REGULATIONS

New regulations regarding the control of venereal diseases in Ohio have been filed with the state department of health and will become effective July 1. They require every case to be reported to the state board within twenty-four hours of diagnosis by physicians and dentists, with the name of the patient and various details, including the source of the infection, if possible. The patient is to be quarantined whenever the state commissioner of health considers quarantine necessary. Medical examination may be required of all persons "reasonably suspected of having venereal disease." This includes all prostitutes and persons associating with them. Co-operation of local health officials in the repression of prostitution is to be secured to the greatest possible extent.

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HEALTH DEPARTMENT WANTS BUREAU OF ORAL HYGIENE

A resolution has been introduced before the committee on general welfare of the Board of Aldermen which provides for the creation of a bureau of oral hygiene in the division of child hygiene of the health department. At a hearing recently held for the purpose of discussing this resolution, Dr. S. Josephine Baker made the statement that of all the pupils in the schools of New York 67 per cent had been found by the department inspectors to have defective teeth. The health department now conducts a number of dental clinics, but desires to make these clinics mandatory on the health commissioner.—*J. A. M. A.*

NATIONAL DENTAL ASSOCIATION

The twenty-second annual session of this association was held at the Auditorium Hotel, Chicago, August 5-9, 1918.

At the first general meeting there was a symposium on the management of pulpless teeth, and up-to-date information was furnished on infections within the roots and periapical tissues. The relative and actual efficiency of medicaments for the sterilization of tooth structures was reviewed, and a report made on the efficiency of current methods employed for the sterilization of dental instruments and root filling materials. Laboratory investigations on the physical properties of root filling materials and the efficiency of root filling for blocking infection from sterile tooth structures were presented, and clinical data with reference to the efficiency of various root filling methods were furnished.

At the second general meeting the president, Col. W. H. G. Logan, discussed the dental profession's contribution to the present war. Major-General William C. Gorgas delivered an address in which he pointed out some of the important changes that have been made in the Medical Department of the United States Army during the past four years. Brigadier-General Robert E. Noble followed with remarks on the plans of the Surgeon-General of the Army for maintaining the health of the soldiers. Col. Charles H. Mayo spoke on medical and surgical progress during the present war. Lieut.-Col. Horace D. Arnold, chairman of the Council on Medical Education of the American Medical Association, discussed the benefits to the medical and dental professions and schools from higher educational standards.

An interesting feature of the meeting was the presentation of a service flag to the National Dental Association by Dr. Donald M. Gallie, Chicago, which was accepted on behalf of the association by Major C. Victor Vignes, of Louisiana. This flag showed that there are 5,981 dentists in the Dental Reserve Corps. Lieut. Vasile Stoica of the Roumanian Legation, Washington, D. C., recounted his experiences on the battle front as a soldier with the Roumanian Army. United States Senator William Borah delivered a patriotic address.

A luncheon was tendered to the former presidents of the association on the stage of the Auditorium Theater. Approximately 1,000 participated in this luncheon, at which speeches were made by Dr. Edwin T. Darby, Philadelphia; Dr. B. Holly Smith, Baltimore; Dr. Harvey J. Burkhardt, New York, and Dr. Frank O. Hetrick, Ottawa, Kan., all ex-presidents of the association. They discussed the problems which confronted the dental profession in the year 1883 which led to the adoption of the present organization of the association and the benefits that have accrued as a result of this reorganization.

One of the outstanding features of this meeting was the oration by Dr. A. W. Thornton, Montreal, Canada, on "A Tribute to the Life Work of the Late G. V. Black." Following the oration of Dr. Thornton, mem-

bers of the association went to Lincoln Park, where the Black Memorial exercises were held. Dr. Truman W. Brophy presented the Black Memorial to the Lincoln Park Board. The unveiling of the memorial was by four granddaughters of the late Dr. Black. The memorial was accepted on behalf of the Lincoln Park Board by Mr. Bertram M. Winston. Dr. Thomas L. Gilmer, Chicago, who was intimately associated with Dr. Black for many years, cited some interesting reminiscences of this distinguished dentist.

The scientific work of the association was divided into seven sections. Many interesting papers were read before these sections on various topics which were freely discussed.

In the United States Army Dental School Section, under Lieut. William E. Henshaw, Lieut. C. R. Hollister and Lieut.-Col. J. H. Snapp, there was an interesting exhibit of charts and models used for teaching purposes at the schools for Army dental surgeons, located at Camp Greenleaf, Chickamauga Park and Fort Oglethorpe. Surgery of the jaw was profusely illustrated and demonstrated by models, based on the experience of surgeons at the front.

The meeting was a great success, both from a social and scientific standpoint, and the attendance was the largest in the history of the association.—*Journal A. M. A.*

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AMERICAN MEDICAL ASSOCIATION

SECTION OF STOMATOLOGY

WEDNESDAY, JUNE 12—MORNING

The meeting was called to order by the chairman, Dr. Frederick B. Noyes, Chicago.

The chairman of the executive committee, Dr. William C. Fisher, New York, submitted the following names of applicants for Associate Fellowship as having been approved by the executive committee:

Brooks, Earl, Noblesville, Ind.

Caughron, John R., 434 Lee Building, Oklahoma City, Okla.

Goldberg, Harry A., 2 West 86th St., New York, N. Y.

Hardy, Charles S., 364 Springfield Ave., Summit, N. J.

Lockwood, Bradley F., Yankton, S. D.

Perry, King S., 719 Jenkins Building, Pittsburgh.

Preston, S., 504 McBain Building, Roanoke, Va.

Rion, C. L., Cobb Building, Seattle, Wash.

Sears, Blake A., 847 Main St., Hartford, Conn.

Singleton, Dickson L., First National Bank Building, Pittsburgh.

Webster, Fred W., 209 Richard Block, Lincoln, Neb.

Williams, Daniel B., 76 West Northampton St., Wilkes-Barre, Pa.

Brown, Walter A., 328 Investment Building, Pomona, Cal.

Harrison, Guy R., Professional Building, Richmond, Va.

Hewitt, W. Stirling, 15th and Locust Sts., Philadelphia.

Jaquette, William A., 235 South 15th St., Philadelphia.

Lotz, Harry Franklin, Joliet, Ill.

McLean, David W., Mt. Vernon, N. Y.

King, Otto U., Chicago, Ill.

West, George N., Chicago, Ill.

Bowles, Shirley W., 1616 I St. N. W., Washington, D. C.

Newton, Thomas G., Northwestern University Dental School, Chicago, Ill.

Dr. D. L. Singleton, Pittsburgh, was recommended by the section in 1916, but through some error his name was never presented to the House of Delegates.

It was moved by Dr. Arthur Zentler, New York, and seconded by Dr. E. S. Talbot, Chicago, that these applicants be approved. Motion carried.

Dr. W. C. Fisher, New York, then moved that the additional names that the executive committee is at this time unable to pass on, be carried over until next year. Seconded by Dr. Arthur Zentler. Motion carried.

Dr. William C. Fisher, New York, brought up the following matter:

Whereas, In our hospitals and dispensaries we have many doctors of German and Austrian birth who have taken out no papers at all or only the first papers of American citizenship, be it

Resolved, That these men be dropped from the staffs of such hospitals and dispensaries for the period of the war.

(Not adopted by the House of Delegates but left to the several hospitals for such action as they consider best.)

Dr. Arthur Zentler moved that it be adopted by the section, seconded and carried.

Seconded and carried as amended.

Dr. Frederick B. Noyes, Chicago, read the chairman's address, entitled "Dental Lymphatic Vessels." Discussed by Drs. E. S. Talbot, Chicago; E. H. Hatton, Chicago; H. A. Potts, Chicago, and F. B. Noyes, Chicago.

Dr. William L. Clark, Philadelphia, read a paper on "An Analysis of Two Hundred Cases of Malignant Disease in the Oral Cavity Treated by Electrothermic Methods, or in Combination with Operative Surgery, Roentgen Rays or Radium."

Dr. Gordon B. New, Rochester, Minn., read a paper on "Treatment of Epithelioma of the Jaws and Cheeks, with Heat and Radium."

These two papers were discussed by Drs. A. J. Ochsner, Chicago; Bertha Van Hoosen, Chicago; Robert Abbe, New York; William L. Clark, Philadelphia, and Gordon B. New, Rochester, Minn.

The chairman appointed as a nominating committee Drs. T. L. Gilmer, Chicago; R. H. Ivy, Philadelphia, and F. B. Moorehead, Chicago.

WEDNESDAY, JUNE 12—AFTERNOON

The meeting was called to order by the chairman, Dr. Frederick B. Noyes, Chicago.

Dr. Kaethe W. Dewey, Chicago, read a paper on "The Lipoids of Tumors of the Dental System." Discussed by Drs. E. H. Hatton, Chicago; Georgine Luders, Rochester, Minn.; Vida Latham, Chicago; F. B. Moorehead, Chicago, and Kaethe W. Dewey, Chicago.

Dr. Eugene S. Talbot, Chicago, read a paper on "The Genesis of Nasmyth's Membrane, the Epithelial Débris in the Peridental Membrane, and the Granular Layer of Tomes." Discussed by Drs. F. B. Noyes, Chicago; E. H. Hatton, Chicago; Martin Dewey, Chicago, and E. S. Talbot, Chicago.

Dr. Robert H. Ivy, Philadelphia, read a paper on "War Surgery." Discussed by Drs. F. B. Moorehead, Chicago; F. B. Noyes, Chicago; E. S. Talbot, Chicago, and R. H. Ivy, Philadelphia.

FRIDAY, JUNE 14—MORNING

The meeting was called to order by the chairman, Dr. Frederick B. Noyes, Chicago.

The following officers were elected: Chairman, Dr. Eugene S. Talbot, Chicago; Vice-Chairman, Chalmers J. Lyons, Ann Arbor, Mich.; Secretary, Dr. Arthur D. Black, Chicago; Delegate, Dr. William C. Fisher, New York; Alternate, Dr. Robert H. Ivy, Philadelphia.

Dr. T. L. Gilmer, Chicago: Just a word about our present secretary, Dr. Talbot. Dr. Talbot has been a member of this section ever since it was organized, and indeed he is one of the men who have helped to make this organization. He has worked very faithfully for all these thirty-eight years. He has always been there. There has never been any one in the section who has done one hundredth part of the work he has done. There has never been any one who has had at heart the interest of the section as Dr. Talbot has had. There is no one who has not conscientiously believed that dentistry is a part of medicine and that we ought to have a branch or section in the American Medical Association, and it is through the efforts of Dr. Talbot and a number of others that we have this section. We feel that maybe he has done a great deal more than had been expected of any one else. We feel that we cannot honor him, but we want to honor the section by making him chairman this year. We will never have a better secretary, but he cannot always work and slave as he has in the past. I want to move a vote of thanks and appreciation of the wonderful work and fidelity of our secretary, Dr. E. S. Talbot.

A rising vote of thanks was given to Dr. Talbot for his work as secretary.

Dr. W. C. Fisher, New York, moved that a committee of two, with Dr. T. L. Gilmer, Chicago, as chairman, be appointed to draw up a letter to be presented to Dr. Talbot at the next meeting when he takes the chair. Seconded and carried.

Dr. Edward H. Hatton, Chicago, read a paper on "Microscopic Studies of Diseased Peridental Tissues." Discussed by Drs. A. D. Black, Chicago; E. S. Talbot, Chicago; V. H. Moon, Indianapolis; F. B. Noyes, Chicago; F. B. Moorehead, Chicago, and E. H. Hatton, Chicago.

Dr. Arthur D. Black, Chicago, read a paper on "Additional Roentgenographic Studies of Infections of the Maxillary Bones." Discussed by Drs. E. S. Talbot, Chicago; T. L. Gilmer, Chicago; Arthur Zentler, New York; F. B. Moorehead, Chicago; Chalmers J. Lyons, Ann Arbor, Mich.; William C. Fisher, New York, and Arthur D. Black, Chicago.

FRIDAY, JUNE 14—AFTERNOON

The meeting was called to order by the chairman, Dr. Frederick B. Noyes, Chicago.

Dr. Arthur Zentler, New York, read a paper on "A New Surgical Procedure for Operating in Cases of Suppurative Gingivitis, with Alveolar Involvement." Discussed by Dr. George Edward Fell, New York; Thomas L. Gilmer, Chicago; Arthur D. Black, Chicago; Truman W. Brophy, Chicago; Frederick B. Moorehead, Chicago; E. S. Fuller, Dayton, Ohio, and Dr. Arthur Zentler, New York.

Dr. Chalmers J. Lyons, Ann Arbor, Mich., read a paper on "Fractures and Dislocations of the Jaws." Discussed by Drs. Thomas L. Gilmer, Chicago; Truman W. Brophy, Chicago; Arthur D. Black, Chicago; John E. Nyman, Chicago; Arthur Zentler, New York; A. W. McCullough, Pittsburgh; Frederick B. Moorehead, Chicago, and Chalmers J. Lyons, Ann Arbor, Mich.

Dr. Vida Latham, Chicago, read a paper on "Fractures of the Bones of the Face, with Complication." Discussed by Drs. Bertha Bush, Chicago; Arthur Zentler, New York, and Vida Latham, Chicago.

Dr. George Edward Fell, Chicago, read a paper on "Sectional Views of the Accessory Sinuses of the Human Cranium." Discussed by Drs. William Brown, Oak Park, Ill., and George Edward Fell, Chicago.

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DENTISTS' MUTUAL PROTECTIVE ALLIANCE

By M. D. K. BREMNER, PRESIDENT, CHICAGO, ILL.

A very important decision was recently rendered by Judge F. A. Geiger, District Judge, Western Division of the Northern District of Illinois, against Dr. William H. Taggart in his suits against Dr. M. D. K. Bremner and other dentists, decreeing the patents on the process of making cast gold fillings invalid.

The case must now be carried to the United States Circuit Court or Appeals for a final decision. Such a decision will finally and conclusively settle the Taggart patents insofar as the Seventh Judicial Circuit, including the States of Illinois, Indiana and Wisconsin, is concerned. It will not legally settle the status of the Taggart patents for any other circuits.

This is a very important decision, in view of the many patents on processes and devices used in dentistry that are taken out every year. There are dozens of patents recorded in the Patent Office now, and this decision against Taggart illustrates how a man may believe his patent is valid but when it is brought up for a judicial test it may be proven invalid.

The purpose of the Dentists' Mutual Protective Alliance is to defend its members in case of prosecution by the owner of a process patent. The men who formed the Alliance believe that patents in dentistry involving their manipulative skill should be submitted to judicial approval the same as are patents in every other art.

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THE TAGGART CASE NOT SETTLED

May 24, 1918.

Dear Doctor:

The Taggart case is not settled—it must now be taken to the Court of Appeals before it will be finally decided. A decision in the Court of Appeals, however, will not legally settle the case for districts outside of the Seventh Judicial Circuit.

Dr. Taggart has prosecuted hundreds of dentists and his patents are still a threatening danger to you. And not only do Taggart patents endanger you, but there are dozens of other patents on methods and devices used in dentistry recorded in the Patent Office. Any of these patent owners may sue you on short notice.

If Taggart or any other owner of a patent sues you and you are not a member of the Alliance, you must then fight your case individually and alone. But when it is known you are a member of the Alliance, an owner of a process patent will be very careful before suing you, for in all the history of process patents there has never been a suit lost when handled by an organization for protection.

The Alliance now has a membership seven thousand five hundred strong. Think what it means to you to have thousands of your fellow workers ready to support you when it comes your turn to be sued—protection for the small membership fee of ten dollars.

Delays are dangerous—several men in Chicago waited too long to "think it over" when Taggart's attorneys demanded a license fee. After suit was started against them, they were glad to settle for \$250 and costs, instead of the \$150 asked of them in the first letter.

Make sure that this does not happen to you. If you "think over" joining the Alliance too long you may lose your opportunity.

Very truly yours,

M. D. K. BREMNER, *President.*

—*Journal N. D. A.*

C. M. CARR PATENT VOID

UNITED STATES COURT DECREES PATENT ON PYORRHEA TOOLS INVALID

Dentists, everywhere will be interested in learning that certain litigation of great importance to the profession has just terminated. The result is a complete victory for the Dental Protective Association of the United States, which, in carrying out the objects of its charter, successfully assumed the defense of a case brought against one of its members.

The Carr School of Preventive Dentistry and Medicine, assignee of Cassius M. Carr, brought suit against Dr. Austin F. James, of Chicago, in the U. S. District Court for the Northern District of Illinois, Eastern Division, for alleged infringement of the Carr patent on Pyorrhea tools and for unfair competition in trade. On Tuesday, July 2, 1918, His Honor, Judge George A. Carpenter, entered a final decree adjudging as invalid, void and of no effect in law these Letters Patent known as No. 1,138,355, issued May 4, 1915, to Cassius M. Carr, on Dental Tools, and which the patentee purports to exemplify in a set of one hundred and fifty tools, well known as the Carr Pyorrhea set. The suit was ordered dismissed for want of equity at the plaintiff's costs.

The importance of the case arises from the establishment of the right of all dentists to avail themselves of instruments of the type described in the patent, in larger or smaller sets, without paying patent tribute to any one. The Dental Protective Association of the United States conceived that the patent sued on was not a good patent in law, and that its existence could be made, and was likely to be made, the basis of serious oppression to dentists, especially in view of the numerous suits already brought under it. The suit against Dr. James was one which the Association considered to be of that character. The Dental Protective Association has consistently fought to protect its members from unjust and unlawful patent claims, and makes no distinction in this respect between patents for mechanical devices and patents for processes or methods. While its chief obligation is to its members, such results as come from its success in the present case will inure to the benefit of the profession as a whole.

A vast amount of testimony was taken by both parties to the suit, the plaintiff having thirty-six witnesses and the defendant twenty-five. For the defendant a large number of the most prominent teachers and practitioners on the subject of Pyorrhea gave valuable testimony.

The defeat of the Carr patent ought to relieve many dentists from the annoyance of litigation which Carr or the Carr School has threatened to institute. The air is cleared and dentists now are justified in treating the patent as though it did not exist.

In passing it may be mentioned that a suit brought by Carr against Dr. Thomas B. Hartzell, of Minneapolis, on the same patent, was defended by the Dental Protective Association and was also dismissed at Carr's costs.

The Association's attorneys are Mr. Percy B. Eckhart, of Chicago,

general counsel, and Mr. Luther Johns, of Chicago, patent counsel. We express our appreciation of their very thorough preparation of the case and its successful defense.

(Signed) DENTAL PROTECTIVE ASSOCIATION OF THE UNITED STATES.

By J. G. Reid

D. M. Gallie

J. P. Buckley

Directors

—*The Dental Digest.*

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AMERICAN DENTISTS IN GERMANY ASSAILED

REPRISALS AGAINST THOSE PRACTISING ARE URGED BY PUBLIC

AMSTERDAM, July 31.—The fact that there are still a number of American dentists practising in Germany is the subject of angry comment in letters to the *Cologne Gazette*. The writers complain that the business of the German dentists now in the field with the army is rapidly falling into their hands.

The correspondents think it "scandalous" that they should be permitted to attend the injured jaws of German soldiers and that no reprisals have been instituted against them for measures taken against German business interests in the United States.—*Daily paper.*

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CLINIC FOR EDUCATION OF WAR VICTIMS OPENS

A clinic for the functional re-education of disabled soldiers, sailors and civilians was opened yesterday at No. 5 Livingston Place, Stuyvesant Square, under the auspices of the Cornell University Medical College.

Dr. Tait McKenzie, of the University of Pennsylvania, who served with Kitchener's army as a physical culture director and expects to sail soon for further service at the front, explained the various appliances which he has designed for the treatment known as mechanotherapy, installed in the new clinic. He told of the many new needs to meet the conditions of the wounded and maimed.

After the first treatment of hot water accorded the disabled man, when the surgeons and physicians have finished their part in his reconstruction, and the massage, which Dr. McKenzie declared the most important phase of the treatment, comes the mechanotherapy, or exercising of the disabled parts of the body.

The clinic will have its first patients today. It is not to be only for soldiers and sailors, but also for persons disabled in munition plant explosions and other accidents.—*Evening World.*

BOOK REVIEWS

By HAROLD S. VAUGHAN, M.D., D.D.S.

ARMY DENTISTRY—Forsyth Lectures for the Army Dental Reserve Corps. Edited by FREDERICK A. KEYES, D.M.D., former Visiting Dentist, St. Vincent's Orphanage, Boston; Consulting Dentist, Medfield State Hospital, Medfield, Mass.; Librarian and Curator of the Museum, Forsyth Dental Infirmary, Boston. D. Appleton & Company, New York, London, 1918.

As indicated by the editor this book is a compilation of lectures given at the Forsyth Dental Infirmary for dentists preparing to enter the Army Dental Corps and is not intended to be a complete text book, but rather a compendium of dental information for review purposes.

Under surgical anatomy of the mouth, the embryonic development of the face is considered briefly, so as to provide an easy understanding of the etiology of the various defects as hare-lip, cleft palate, oblique and transverse facial clefts. The anatomy of the head and neck is reviewed from a surgical standpoint with a brief study of the various subdivisions, including the histology of the teeth and structure of the oral cavity, also the relations within the surgical triangles of the neck.

The later advances in physiology are included, especially the more recent knowledge obtained. From a study of the ductless glands under a chapter including pyorrhea the exploded ameobic theory is definitely condemned. The writer also says in considering focal infections, "so minor and so small a thing as a dental abscess with all its protective and walled-off structures, with all the forces of immunity between it and danger, cannot be the cause of all the ills that theorists attribute to it." Although there may be a tendency towards over-enthusiasm on the part of some who are interested in this work, the weight of evidence against focal infections is too great to permit acceptance of such statements, and it is unfortunate that they should appear in a book that has a teaching value.

In the chapters on the action of drugs and preoperative and post-operative care of the patient much useful information is condensed. The subject of maxillary and mandibular fractures is well covered and should prove especially valuable for the dental officer, though the modern bands and arches and tooth wiring methods in the hands of the skilled operator entirely replace the crude primitive appliances, many of which are illustrated.

The chapters on extraction of teeth, surgical technic and bandaging, and military dental X-ray work, contain much interesting and in-

structive matter. In addition there is considerable information on military administration, field service regulations and other matters of importance to the dental officer. Besides the purpose for which it is intended, the book should have a wide demand among civilian dentists, as it contains so much easily available information.

THE NORMAL AND PATHOLOGICAL HISTORY OF THE MOUTH, being the Second Edition of the Histology and Patho-Histology of the Teeth and Associated Parts. Revised and enlarged by ARTHUR HOPEWELL-SMITH, L.C.P.R., Lond., M.R.C.S., England, L.D.S., England, Professor of Dental Histology, Pathology and Comparative Odontology, University of Pennsylvania, Philadelphia; John Tomes, Prizeman of the Royal College of Surgeons of England, Membre Honoraire de la Societ  Odontologique de France, formerly Lecturer on Dental Anatomy, Surgeon and Demonstrator of Dental Histology at the Royal Dental Hospital of London; Member of the Faculty of Medicine of the University of London, External Examiner in Dental Surgery at the Universities of Birmingham, Leeds and Liverpool; Lecturer on Dental Surgery and Pathology at the National Dental Hospital, London. Volume I, Normal Histology with 2 colored plates and 262 illustrations in the text, including 149 original photo micrographs by the author. P. Blakeston & Co., 1012 Walnut Street, Philadelphia.

A thorough knowledge of normal histology as the minute anatomy of the tissues is essential for a correct understanding of the pathological processes that are met with. It is especially important in tissues like enamel and dentin, that have no power of repair, and more so in the case of pulpless or nonvital teeth.

In this work the author has added much material, the result of personal investigation, to the accepted knowledge on the subject. Part I includes the study of enamel, dentin cementum, dental pulp and the alveol-dental membrane, each in turn being thoroughly explained and made clear by most excellent photo-micrographs, which makes the work of the student easier.

The author admits that the distribution terminations and anastomosis of the nerve supply to the pericementum is a subject that so far has been practically ignored. In view of the importance of multiple apical foramina to the root canal problem, some of the recent published data on the subject should appear in a standard teaching textbook.

Part II, the oral tissues, includes a brief study supplemented by excellent illustrations on the lips, cheeks, tongue, salivary glands, hard and soft palates and palatine tonsils. Chapter X takes maxillary and mandibular bones, gives the histological characteristics of various areas of these bones, such as the canine fossa, nasal wall of the antrum angle of mandible and alveolar process, while the next chapter gives the soft tissues as the gums, mucous membranes, absorbent organ for the temporary teeth, mucous glands and lining of the antrum of Highmore.

Part III, the study of the histogenesis of the teeth of mammals, fishes and reptiles. Chapter XII gives a very complete and detailed study of the development of the teeth in mammals, being well illustrated by drawings and photo-micrographs.

In the appendix is a discussion of the functions of the cells of the pulp in which the author's views are given in connection with those of the important investigators in this field. He also takes the view held

by many that the alveolar process in the jaws of man is a transitory and unstable structure which early in life shows signs of degeneration.

The book has a well earned place as a standard dental textbook.

THE NORMAL AND PATHOLOGICAL HISTOLOGY OF THE MOUTH, being the Second Edition of the Histology and Patho-Histology of the Teeth and Associated Parts. Revised and enlarged by ARTHUR HOPEWELL-SMITH, L.C.P.R., Lond., M.R.C.S., Eng., L.D.S., Eng. Volume II, Pathological Histology with 394 illustrations in the text, including 343 original photographs and photo-micrographs by the author. P. Blakiston's Sons & Co., 1012 Walnut Street, Philadelphia.

In Volume I of this work the normal histology of the teeth and associated parts was presented, thus laying a foundation for the study of the pathological histology of these tissues.

Chapters I, II and III take up the pathological conditions of enamel, dentin and cementum, considering in turn developmental and acquired disease.

The subject of Dental Caries is clearly explained in its progress through enamel, dentin and cementum, the various phases being well illustrated by excellent photo-micrographs.

Diseases, injuries and degenerations of the dental pulp are very fully considered in succeeding chapters, giving a mental picture of what occurs in the various stages from simple hyperemia to gangrene of the pulp.

A brief study is made of the diseases of the alveolo-dental periosteum, such as inflammation, abscess, benign and malignant tumors that arise from this membrane.

In Chapter XI on pyorrhea alveolaris the author considers the etiology of this disease to be "undetermined at present but probably constitutional diseases, coupled with infection of the gum margins with pyogenic cocci, may briefly be considered potent factors in its causation." The pathological changes in the gingival margins, peridental membrane, apical region, cementum and bone of the jaw are recognized, but to the reviewer he has failed to note one of the most potent factors in bringing about retrograde changes and atrophy of the supporting structures, viz.: over-occlusion, a better term is traumatic occlusion. (Stillman).

Part II, the oral tissues, includes a study of the pathological conditions of the gums, palate, antrum and jaws. The various tumors, benign and malignant, are classified and described, as well as the lesions in tuberculosis and syphilis.

The dental tissue tumors, odontomes and odontoceles are clearly differentiated and described in the section; Oral Microbiology is also classified in detail in this section.

The book is well sub-divided, clearly written and profusely illustrated. It should hold a high place as a standard text book.

DENTAL ELECTRO-THERAPEUTICS. By ERNEST STURRIDGE, L.D.S. (Eng.) D.D.S., Fellow of the Royal Society of Medicine, Member of the British Dental Association, Member of the British Society for the Study of Orthodontics, Member of the American Dental Society of Europe, Contributor on Dental Electro-Therapeutics in "The Science and Practice of Dental Surgery" on Ionic Medication in Prinz's "Dental Materia Medica and Therapeutica." Second edition thoroughly revised. Illustrated with 164 engravings. Lea & Febiger, Philadelphia and New York, 1918. \$2.75 net.

The extensive development of Dental Electro-Therapeutics serves as a reason for the second edition of Dr. Sturridge's book.

Part I, devoted to electro-physics, takes up the study of static and galvanic electricity, explaining the apparatus used in producing electric currents. The various electrical units are defined and explained. All electrical appliances used in the dental office and laboratory are considered in detail.

Dental Radiography is taken up and many useful hints are given in the use of the X-ray, in the placing of films—interpretation, errors that may arise in reading films, etc.

Part II is given over to electro-therapeutics. Attention is given to the conduction of ions, the physiological effects of currents in the tissues, the passage of currents through the body, the motor, sensory and special nerve effects.

Ionic medication, to which the author has given much study, receives full attention. Some of the conclusions as to favorable results obtained by electro-therapy are influenced to a great extent by enthusiasm for the method, rather than critical analysis. The subject is well covered, the book has a place in the library of every dentist, as well as being a valuable text book for the student.

ORAL SEPSIS IN ITS RELATIONSHIP TO SYSTEMIC DISEASE. By WILLIAM W. DUKE, M.D., Ph.B., Kansas City, Mo., Professor of Experimental Medicine in the University of Kansas School of Medicine, Professor in the Department of Medicine in Western Dental College, Visiting Physician to Christian Church Hospital, Consulting to Kansas City General Hospital, Kansas City, Mo., and to St. Margaret's Hospital, Kansas City, Kansas. With 170 illustrations, 124 pages. C. V. Mosby Co., St. Louis, Mo., 1918.

The author of this book is a physician of large experience, who has made a careful impartial study of oral focal infections, and is thoroughly familiar with the literature of this subject.

The chapter on "Pyorrhea Alveolaris" gives a short resumé of the etiology, taking well into consideration the relation between the local and systemic factors.

Chapter III on alveolar abscess is profusely illustrated by X-ray films which show root-end infections before and results obtained by sterilization and filling the canals, emphasis being placed on the fact that more positive results are obtained by careful root technique to prevent such infections rather than for their cure when once developed.

The chapter on metastatic infections, toxic effects of oral sepsis and headache should be carefully considered by the reader, as one can thus obtain a better insight into the part played by focal infections in the etiology of many chronic disorders that were formerly considered

to be of obscure origin. The subject has been presented so as to make the book of value both to the physician and dentist.

INTERPRETATION OF DENTAL AND MAXILLARY ROENTGENOGRAMS. By ROBERT H. IVY, M.D., D.D.S.; Major, Medical Reserve Corps, U. S. Army; Associate Surgeon Columbia Hospital, Milwaukee, Formerly Instructor in Oral Surgery, University of Pennsylvania. With 259 illustrations. St. Louis; C. V. Mosby Company, 1918.

The increasing dependence upon the X-ray for diagnosis in dentistry and oral surgery necessitates careful interpretation of the findings, as many errors are met with due to lack of clinical experience, knowledge of anatomy and pathology; the suggestions in this small book are very timely.

Chapter II takes up the structure of bone, important anatomical landmarks and foramina are considered; so deviations from normal can be distinguished when met.

A working explanation of the pathology of periapical infection and infection of the investing and supporting structures of the teeth is given, followed by suggestions in the roentgenographic examination of the teeth—the position of the patient—the localization of objects within the bones and other important factors.

Chapter V contains much valuable advice as to the course to be followed in definite types of pathological teeth or infected foci.

The illustrations consist mainly of reproductions of films indicating various types of diseased focal areas and other pathological conditions.

The book is indicated for the dentist who wishes to increase his knowledge on this important subject.

DENTAL AND ORAL RADIOGRAPHY. A Textbook for Students and Practitioners of Dentistry. By JAMES DAVID MCCOY, D.D.S., Professor of Orthodontia and Radiography, College of Dentistry, University of Southern California, Los Angeles, California. With 123 illustrations. Second Edition. St. Louis; C. V. Mosby Company, 1918.

The importance of radiography in the daily practice of dentistry has long been recognized by the progressive dentist. It can be stated that the operator who treats and fills root canals without the assistance of the X-ray is guilty of malpractice. Every dental office should have such equipment. That this need is being met is shown by the increasing demand for concise information on the subject.

In the preparation of this book the author has admirably presented the needs of the beginner, the kinds of electric currents, the units of current strength, resistance, power and force are explained. The types of machines, such as the induction coil, the high frequency coil and the interrupterless transformer are discussed. Valuable suggestions are given for the arrangement and installation of apparatus.

In Chapter VI the technic of dental and oral radiography is given, indicating the position for tube, films and plates so as to avoid distortion.

Extra oral methods are shown and illustrated so the dentist may obtain plates without the necessity of more complicated accessories.

Due importance is given to the proper arrangement of apparatus and tubes and the proper interpretation of X-ray based on a thorough under-

standing of the normal anatomical appearance of the tissues. The dangers of the X-ray, with proper methods of protection, are fully considered, so the beginner by following instructions can take up the work without risk.

This book is valuable for the student and practitioner who is a beginner in this subject.

PATHOLOGY AND BACTERIOLOGY FOR DENTAL STUDENTS (Second Edition, Revised), GENERAL PATHOLOGY AND BACTERIOLOGY FOR DENTAL STUDENTS. By GUTHRIE MCCONNELL, M.D., Director of the Clinical and Roentgenological Laboratories of the Waterloo Medical Society, Iowa; Captain, Medical Reserve Corps, U. S. N.; formerly Professor of Pathology and Bacteriology in the Philadelphia Dental College. Second edition revised 12mo. of 314 pages with 109 illustrations. Philadelphia and London; W. B. Saunders Company, Philadelphia, London, 1918. Cloth, \$2.50 net.

In the author's foreword he states that no attempt has been made to make this a textbook of special pathology of the mouth, yet the liberty has been taken to describe in some detail certain of the more abnormal conditions of the mouth. The book is brief yet complete in the field it covers. The early chapters take up disorders of metabolism, circulatory disorders and retrogressive processes. Under these headings the student is given a concise understanding of the pathological processes that are included under these headings.

Cell division and cell functions are clearly explained leading up to inflammation, regeneration and the various phenomena occurring in the repair of wounds, which are very clear, giving the student an accurate mental picture of the process of tissue repair. In Chapter VII the specific inflammations (Granulomas), Tuberculosis, Leprosy, Glanders, Actinomycosis, Syphilis are briefly explained.

The chapter on neoplasms is especially good in that the theories of origin are clearly stated. The classifications and varieties are sufficiently illustrated to give the student a working knowledge for future special study.

Chapter X, under special pathology of the mouth, refers briefly to the various forms of stomatitis, tumors, glossitis, cysts, inflammation of pharynx-larynx and salivary glands, also slight reference to Ludwig's and Vincent's angina. The importance of focal infection as a factor in general disease is explained.

The latter part of the book is devoted to bacteriology; much useful information is given in the classification of bacteria, the approved methods of sterilization, disinfection and staining of bacteria.

Considerable study is given to the specific forms of pathogenic microorganisms, infection and immunity, with a clear definition of Ehrlich's side chain theory.

Laboratory technique for embedding, cutting, staining, with formulas for the general and special stains, makes the book a valuable manual. It can be highly recommended for dental students, as it is teeming with information succinctly stated and easy to grasp by the beginner.

PRINCIPLES AND PRACTICE OF FILLING TEETH. By C. N. JOHNSON, M.A.L.D.S., D.D.S. Professor of Operative Dentistry in the Chicago College of Dental Surgery, Editor of the Dental Review. Fourth edition revised and enlarged with 127 illustrations. Philadelphia; P. Blakiston & Co., 1012 Walnut Street. Price \$3.00.

The fourth edition of this standard text book has been revised to meet the growing needs due to changing methods in modern dental practice.

The arrangement and order of the various subjects adapts the book especially as a teaching text book, and the author's long experience as a teacher lends conviction to his statements.

The chapter on deposits on the teeth and oral prophylaxis emphasizes the importance of first putting the patient's mouth in proper hygienic condition, rather than, as too often the case, the operator thinks only of the cavities to fill and restorations to make.

The subject of the gold inlay has been covered more fully in this edition and its merits brought forward. The author seems to lean toward the direct method in making inlays, though the writer ventures the opinion that the majority of finished operators feel that better results are obtained by the indirect method.

The chapter on pulp capping is particularly sound, the advice on when pulps should be treated conservatively, and the method of pulp capping gives the student the best course to follow.

On pulp destruction the author places too much reliance on the obsolete method by the use of arsenic and fails to consider the modern method of nerve blocking by local anesthetics.

The value of the X-ray in the management of pulpless teeth has been well emphasized, and a note of protest is sounded against the loose diagnosis sent out by radiographers who have had no clinical experience in the treatment of teeth.

The whole subject of operative dentistry has been so clearly stated that the book can be studied with pleasure as well as profit.

NOTICES

MASSACHUSETTS BOARD OF DENTAL EXAMINERS

A meeting of the Massachusetts Board of Dental Examiners will be held in Boston, Mass., October 21 to 25, inclusive, 1918, for the examination of candidates for registration. All applications must be in the hands of the Secretary on or before October 11. For further information address George H. Payne, Secretary, 29 Commonwealth avenue, Boston, Mass.

HARVARD AND TUFTS TRAINING SCHOOL DENTAL HYGIENISTS

The Commencement exercises of the Harvard-Tufts Training School for Dental Hygienists were held at Hotel Thorndike, Boston, Mass., on June 21, 1918.

The program included a dinner, addresses by Dr. H. C. Bumpus, President of Tufts College, Dr. George H. Wright, Dr. Wm. Rice, Dean of Tufts College Dental School, Dr. Henry H. Piper, Dr. Leila M. Taylor, Director of the School, and Miss B. L. MacFarland of the graduating class.

Dr. Eugene H. Smith, Dean of Harvard Dental School and Chairman of the Administrative Board of the Training School, presided and awarded the certificates.

LEILA M. TAYLOR, D.M.D.
Secretary.

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JOHN A. McILHENNY,
President, U. S. Civil Service Commission,
Washington D. C.

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Abbreviations: abs., abstract; disc., discussion; rev., review; edt., editorial; ed., editor.

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THE NEED OF A STABILIZER IN DENTAL PRACTICE¹

By C. N. JOHNSON, M.A., L.D.S., D.D.S.

IT is rare that we find a perfectly well-balanced individual, and therefore it is not to be wondered at that a certain group of individuals in the form of a profession are sometimes found deficient in balance. If we study the progress of dentistry we shall find that all along the way the path is strewn with the wrecks of ideas and theories which for a time flourished under the enthusiasm of their advocates, and then, seeking their inevitable level, they have fallen by the wayside and left nothing but an uncanny memory. Few of these theories have been wholly devoid of merit, and few of them have escaped doing considerable harm on account of the extremity to which they have usually been carried by their sponsors. All down the line from the day dentistry began to assume the status of a profession there has been apparent the need of a stabilizing influence which would hold the profession into avenues of sanity and good judgment, or as the dictionary has it so that it would not be "easily moved from a state of equilibrium."

It would be fruitless to review the fads which have swept dentistry at various times were it not for the fact that by studying some of the phenomena presented by these fads we may be

¹ Read before the First District Dental Society, S. N. Y., Nov. 4, 1918.
See disc., p. 442.

able to detect the evidence of approaching fads and profit sufficiently to prevent in the future the same degree of harm that has been done in the past. It is often stated that in order to work a reform it is necessary to carry it to an extreme to force it on the attention of the profession. To this idea your essayist does not in the least subscribe. He has seen so much injury done by extremists that he has grown what in the vernacular is called "gun-shy" when he sees a tendency toward pushing any new idea to an extreme. Many a worthy method of practice has been brought into disrepute through the extremity to which it has been forced by its enthusiasts. Sanity is just as essential in estimating values and gaining a proper perspective in modes of professional procedure as it is in sociology or statesmanship, and nothing is to be gained by going to grotesque ends in either. The lack of balance has been accountable for much real harm to our patients, and the time has come for the profession to take itself severely in hand and check the all too prevalent tendency to wander off into extremes.

Let us go back some years into the history of dentistry and consider briefly a few of the outstanding theories which for a time rode the profession wildly, and frequently to its detriment. Take for instance the so-called "New Departure" creed. Here was a propaganda launched and carried on by brainy and aggressive men, whose energy was equaled only by their lack of logic. There is no question raised as to their conscientiousness, but it is safe to assert that this theory, pushed as it was by all the vigor of some very able advocates, did more real harm to dentistry than can ever be computed. The slogan which placed the plastics on a pedestal so far as filling materials were concerned, and which proclaimed that: "In proportion as teeth needed filling gold was the worst material with which to fill them" led a gullible profession into the by-ways of dental deterioration, and threatened to sweep away forever the splendid foundation which had been laid with such painstaking care by the sturdy old pioneers who had made American dentistry what it was, chiefly through the medium of saving teeth with gold foil. It is entirely safe to assert that had it not been for gold and all the splendid traditions which clung around its use by the brilliant band of men who had

perfected its manipulation, dentistry would never have attained the commanding position it did among the professions. It would still have continued to smack of the blacksmith shop, the barber shop and the little corner drawer in the surgery which contained a couple of pairs of forceps.

The New Departure would not have done the harm it did if it had been constructive in any way, but it contented itself chiefly with tearing down rather than with building up. It is true that it sought to glorify the plastics, but it did nothing tangible to add to our knowledge of the physical character of the plastics, nor did it result in a material improvement in their manufacture. It was long after the New Departure had spent its fury that the physical character of the plastics was scientifically studied and their manufacture placed on a satisfactory basis.

The chief effect of the New Departure creed was to stampede a lot of men in the profession, who either had not the ability or lacked the energy to properly manipulate gold, into a wholesale use of the plastics, and it resulted in a lowering of the manipulative ability of the rank and file of the profession as nothing else had ever done. Men were only too glad to appease their conscience by pointing to a dictum coming from noted members of the profession which justified them in doing things in an easy way, and much slip-shod work which the leaders of the New Departure would never have advocated was the inevitable result. No less a man than our distinguished colleague, Dr. Edwin T. Darby of Philadelphia, made the remark at the last meeting of the National Dental Association in Chicago that the time would come when the profession, forgetting or ignoring the teachings of the New Departure, would come back to gold as the main sheet-anchor for saving teeth, and I think we may say that it has already largely begun to do this in the form of the gold inlay.

In all of this no question is raised of the splendid service which the plastics have given under their proper indications, or of their great value in saving teeth. We have need today, as we have always had need, of every filling material at our command, but to magnify the virtues of the plastics at the expense of gold, as was so freely done by the campaign to which I have just referred, was false in theory and disastrous in results. It was

just at this period that the profession had sad need of a strong stabilizing influence which would have steadied it, and rendered it less "easily moved from a state of equilibrium."

Coming down to more recent times we have the furor caused by the practice of cataphoresis. What was not promised to our patients in the way of immunity from pain in the preparation of cavities by this method? But how quickly the wave passed, leaving the remains of cataphoric outfits pushed away under the laboratory bench out of sight.

This was succeeded in due time by the panacea of analgesia. How fervently were we admonished at the introduction of analgesia that no humane dentist would dare to presume to prepare cavities without it the moment the public learned of its full beneficence. It was heralded from the housetops that the dental millenium had come, and woe betide the man who dared to raise his hand and question the advisability of the method. Those who had the temerity to advise caution and conservatism or who argued against the general use of analgesia were treated with scant courtesy by the enthusiasts. They were called by the euphonious names of "moss-backs," "has-beens" and "back-numbers," and were relegated to the intellectual scrap-heap generally. But analgesia followed the wake of cataphoresis, and left the same trail of worthless apparatus. In this connection be it said that much of the impetus given these two methods of practice, particularly the latter, was fostered not so much by dentists themselves as by manufacturers of the apparatus which was used in the process. Experts in the manipulation of the machines were hired by the manufacturer to "demonstrate" the method, and some of our representative dental societies were imposed upon by having these men appear before them in the guise of clinicians when they were actually in the employ of the manufacturer. This tendency is growing altogether too prevalent for certain manufacturers to pose as teachers of dentistry, ostensibly for the purpose of enlightening members of the profession, but actually with the sole idea of unloading their wares upon them—their interests in making a sale invariably over-balancing their desire to impart useful knowledge. How much harm has been done in this way can never be known in the aggregate, but

the discarded apparatus in the office of many a dentist tells a story which cannot be gainsaid.

There were many worthy men connected with the advocacy of cataphoresis and analgesia who earnestly and honestly sought to alleviate human suffering and whose impulses were wholly commendable. No criticism is made of these men except to say that they needed a stabilizer to steady their judgment and give them a proper perspective.

And so we might continue all along the line ever since the profession began to record its ideas, and note instance after instance where enthusiasm has over-balanced judgment and carried men into extremes of practice which have wrought serious harm to their patients, because after all it is ultimately the patient who has to suffer most from this lack of balance.

Coming down to the present hour it may be well for us to consider with some care a subject which is probably uppermost in the minds of most practitioners of the day—the far reaching effects of focal infections and the possible relation of pulpless teeth to systemic disorders. With this, as with every other new line of thought, there is grave danger of much harm being done unless the principle of the stabilizer be applied. In fact, there has already been harm, and we as conscientious practitioners need to study the situation most carefully to the end that we gain a proper perspective, and minimize as much as possible the damage that may otherwise result.

No man with any sanity or conscience would for a moment contend for the retention of pulpless teeth in the mouth of a patient where it could be demonstrated in any manner that they were a menace to the patient's health. Neither will it do for us longer to sanction the extraction of so many useful teeth as have been sacrificed in the recent past on the mere suspicion that they may be doing harm without, in many instances, a scintilla of evidence to prove that they are. The dental profession has been stampeded, largely through the influence of the medical profession, into the extraction of numberless teeth which were innocent of any wrong, and it is time that we did some thinking for ourselves to the end that we may show forth the faith that is in us, and protect our patients from so much injury. That the situation

has in large measure been taken out of our hands is more our own fault than the fault of the medical profession, and to carry the reasoning a little further, it is not so much the fault of any one as it is the exigencies of the situation itself. When the prominence of focal infections as a cause of systemic disease was first emphasized, it was logical for medical men to look about for the most prolific source of these infections. The selection of the teeth as the chief scapegoats was partly natural and partly accidental. It was natural because the dental profession had for many years been calling attention to the teeth as a very significant factor in bodily health—most of the time, be it said, to deaf ears so far as the medical profession were concerned—and accidental because just about that time Hunter of London, England, had made his famous pronouncement on “Oral Sepsis” which was published in the London *Lancet*. The medical profession is just as much in need of a stabilizer as is the dental profession, and so we have the spectacle of a large number of the medical profession turning to the teeth as the chief cause for all the ills to which human kind is heir.

But curiously enough the particular infection which today is charged with being the chief source of metastatic trouble, and to which attention is largely focused, is something that Hunter never mentioned from beginning to end of his article. Hunter is credited everywhere with being the agency through which the evils of mouth infection were brought home to medical men and dentists, and yet he never referred even remotely to periapical infections—the form of infection which today looms largest on the medical and dental horizon. He says in part “As I have shown, the course of septic infection is from the gums to the periodontium (Periosteum) of the root, and thence to the bone of the socket. The results are septic gingivitis with ulceration, septic periodontitis (periostitis) with ulceration (pocket formation) rarefying osteitis of the tooth itself or of the socket, with loosening of the tooth. As a result and accompaniment of the whole of these processes, we have the formation and deposition of tartar in larger or smaller amounts on the edges of the gums, in the pockets or on the tooth itself. The prime causal factor in all these processes—gingivitis, periodontitis and periostitis, osteitis

and tartar deposits—are the results of this septic inflammation and ulceration.”

To extend the greatest latitude to Hunter's looseness of dental nomenclature one can never by the wildest stretch of the imagination attribute to him any reference whatever to infections occurring at root ends in the form of apical abscesses. In his treatment he never mentions anything but clearing the mouth and gums and teeth of septic material which is clinging to them, and speaks of swabbing with antiseptic solutions, etc. He confidently claims that by this treatment he obtains the greatest measure of amelioration in the systemic symptoms of the patients so treated, and in this I feel sure he will receive the hearty endorsement of the dental profession. From the time dental literature began to be written dentists have urged on the medical profession the necessity for increased attention to the whole subject of oral hygiene. We have claimed all along that a filthy mouth was a menace to the physical well-being of the individual, and while such ideas move slowly we had, at least in this country, made some progress even before Hunter published his article. Medical men were instructing their nurses to care for the mouths of their patients, and as a consequence we were finding fewer relapses in dental decay and in diseases of the supporting structures of the teeth following illnesses than we had been accustomed to seeing.

The concentration on root-end infections developed some time after Hunter's article, yet strangely enough he has been credited with starting the entire propaganda.

Now let us see how the matter has worked out so far as our patients are concerned. An individual becomes ill and consults his physician. This being the medical era of teeth, these organs are at once suspected, and the patient is referred—not to the family dentist, which would be the logical procedure, but—to the radiographer. And it is just at this point that much mischief has started. The radiographer is usually a man with a vision—in fact he has many of them. It is his function to “see things,” and it is a rare mouth in which he cannot find “abscesses,” “infections,” “rarefactions,” or as a last resource “pyorrhea.” He sagely writes his diagnosis on a card and either sends it to the physician, or, what is infinitely worse, he hands it to the patient. These

terrible terms he has written sound formidable to the laity. People have died of "infection," and died quite suddenly. The physician usually does not claim to be able correctly to interpret radiographs of the teeth, and naturally relies on the findings of the radiographer. With all of these circumstances the road to the exodontist is a very short one. I quite envy the exodontist the prestige he has attained as a savior of the human race.

But it so befalls that these people are not always saved by the extraction of the teeth, and it is found that a mistake has been made somewhere. The simple truth is that several mistakes have been made. It is a mistake in the first place for physicians to concentrate on any one thing as a universal cause of disease. They have done this so many times and found themselves in error that it would seem as if they might profit by it, and learn to be broader in their mental vision. It is a mistake to rely on a radiographer in every instance for a diagnosis. Radiographers are human, many of them exceedingly so. Sometimes they are physicians who have given little attention to the anatomy or pathology of the teeth and supporting structures, some are dentists who have given little attention to anything, and some are neither physicians nor dentists, but merely men who make pictures. Yet all of them write a diagnosis with equal facility. It is a mistake wholly to ignore the family dentist when it comes to a consideration of the teeth. He probably has records of the suspected organs and may be able to throw much light on the case. He should at least be consulted in any decision that is to be made, and it will be found that he will cordially coöperate in every way possible to eliminate disease from the mouth. And many times, be it said, this may be accomplished without the extraction of the teeth.

But most of all it is an unpardonable and a ghastly mistake to hand the patient a written diagnosis by the radiographer with all of these formidable terms written over it. In too many instances it is done purely for effect and to make the function of the radiographer appear a very important one in the eyes of the patient. Thus to commercialize the human emotions and play on the fears of the public is perfidy of the worst type, and it has been done altogether too frequently to be longer tolerated.

This is not intended as an arraignment of radiographers generally. Many of them are conscientious seekers after the truth, and are doing incalculable good in clearing up obscure conditions. All progressive men will welcome them as a great aid in diagnosis, and yet not one of them has the right to say to a patient that a tooth is "abscessed" or that there is "infection" in the mouth, simply because he does not know. In fact no diagnosis should ever be made on X-ray evidence alone, but always in conjunction with the clinical findings in the case. Both are needed, and one is as valuable as the other. In any event, the radiographic findings should be reported to the physician and dentist rather than to the patient, so that a conservative and constructive opinion may be formed without needlessly alarming the patient. It is only in cases where the patient demurs at having the necessary remedial measures taken that the suspicion of infection should be forced on them.

The time has come when radiographers should be censured severely for giving a diagnosis to patients. There are two reasons for this aside from the fact that many of them are not pathologists and have no right to pass on pathological conditions. And these reasons concern vitally the attitude of not only the radiographer but of the physician and the dentist to this whole question.

The first reason is that no man can tell whether a rarefied area in an X-ray picture at the end of a root represents an abscess or whether it is a case where the bone has been thinned by an absorptive process which may have occurred years previously and which today is filled with tissue which is perfectly harmless. It is in such cases as these that the clinical history of the case as given by the dentist who has cared for the patient is of great value in throwing light on the decision. Your essayist does not minimize in the slightest degree the difficulty of deciding in some of these cases as to whether or not there is infection, and he freely admits that he would rather err on the side of a suspicion of infection than to rest complacently on the assumption that all of them were harmless, and let the case drift along. But what he does object to is the offhand and altogether routine practice of assuming infection in every rarefied area, and the equally offhand

decision that the teeth must be extracted. This is such a cruel injustice to the patient—an injustice which frequently leaves the patient permanently impaired for mastication—that a halt should be called upon it whether perpetrated by the physician or the dentist. With very many of these teeth even where there is infection the condition can readily be cleared up by treatment and the tooth made safe and serviceable for many years. This has been demonstrated too frequently to be gainsaid with mere assertion. The practice of carelessly condemning patients to the wearing of artificial dentures through life without any legitimate excuse for it must cease if we are to have the respect of the people. The utter thoughtlessness with which certain professional men order teeth extracted on the mere assumption that they are at fault, and without an adequate scrutiny of the conditions present, constitutes a serious reflection on the men who are doing it, particularly so when they are constantly asking patients to have teeth removed under circumstances which, if they existed in their own mouths, they would never think of submitting to such an operation.

The other reason is that no man can affirm today just how intimate the relationship is between pulpless teeth and the many systemic disorders which in the recent past have so freely been attributed to them. In making this statement your essayist is conscious that he invites a vigorous storm of protest. The assumption is firmly fixed in the minds of the profession that many diseases such as arthritis, endocarditis, etc., are directly traceable to infections from pulpless teeth, and he would be the last one to underestimate the teeth as possible causal factors in many of these affections. But he still affirms that, much as has been written on this subject, the percentage of cases of these affections which can be legitimately attributed to the teeth has never been definitely established. It will not do to state that because it is possible to demonstrate the same microörganism in pulpless teeth and in arthritic joints that the teeth are invariably the primary cause of the infection. It will not do to assume because a subsidence of the arthritic conditions has followed the extraction of the teeth in some instances that the teeth are always at fault. We should have more data on this subject. Account is not taken of the

other clinical fact that in many instances the extraction of the teeth has not been followed by an amelioration of the systemic symptoms, and in many others the symptoms have cleared up without the extraction of the teeth. We need a stabilizer here. There is apparently as much evidence on the one side as on the other, and until we know more about the subject we are not justified in longer submitting to the wholesale extraction of teeth as ordered by physicians.

Conscientious as many of them are in their convictions and helpful as they may be in aiding us to gain a proper perspective in the management of disease we still contend that a long clinical experience in the treatment of diseased conditions of the teeth and surrounding parts, and a close observation of the phenomena existing in the mouth justify us in having some voice in the matter. In other words we cordially invite their coöperation, but we respectfully object to their dictation.

To sum up this whole question, we need with this, as with other matters affecting the welfare of the profession and the people we serve, a calm conservatism which shall protect us from running off into extremes of all sorts as we have done in the past. There is no question that in times gone by teeth have been retained that should have been extracted. All of us have erred in this particular. But now we have gone to the other extreme of sacrificing many useful teeth that would have been of great benefit to the patient, and that were blameless of any ill, merely through lack of balance and perversion of judgment. My present plea is for an open mind and the courage to do the thing which the dictates of our calmer conscience tells us is right.

Marshall Field Building, Chicago, Ill.

TECHNIC OF ROOT PREPARATION AND PORCELAIN JACKET CROWN CONSTRUCTION¹

BY GEORGE A. THOMPSON, D.D.S.

WHEN the preparation of a tooth for a porcelain jacket crown is brought up for discussion the individual without experience in this type of work always asks, "Don't you find it difficult to control the severe pain?" or "Do you use conductive anesthesia?" Why this should be the first thought in the minds of many men puzzled me considerably. Can it be that this type of work is *totally* misunderstood? Does anyone suppose that we try to do the work of the orthodontist and correct irregularities by this method? At least it is not so in my practice. The type of cases for which I use this crown is that in which a crown of some type must be employed, where some men use large mesio-disto-incisal gold inlays; bad abrasion where the bite is to be opened; cases that result from accidents. The average case has large gold foil fillings or porcelain inlays which have failed, or by accident or wear the angles are broken away.

I have made and set over three thousand of these crowns in all manner of cases for all types of patients, and I never had a case where I failed to make the proper preparation, and no one has ever complained of being subjected to an unusual degree of pain. I have never used analgesia or any form of anesthesia in this work. I am of the opinion that they are never needed, if not absolutely contraindicated, for the reason that the tooth may be overheated and result in a hyperemia and inflammation which would later lead to a pathological condition. Only the men who lack the proper technic and confidence in themselves will feel the need of anesthesia. Just stop a moment and think of the psychology of its use. Once the operator is the master

¹ Read before The First District Dental Society, S. N. Y., Oct. 7, 1918.
See disc. p. 435.

of the technic and has the confidence to accomplish it, he will no longer need anesthesia. With the confidence which will come with experience he can properly prepare any tooth for any patient with very little pain. Less pain than one would experience with a M-O-D preparation for a gold inlay.

The first consideration is a roentgenogram. Even if the tooth is vital this is necessary if we are to regard the whole mouth as a unit. The particular tooth we wish to crown may be all right, but one of the teeth on either side may be extracted for some reason, and our tooth with the jacket crown on would then present another problem which might be embarrassing.

The removal of enamel from a vital tooth as we tried to do it years ago was the most painful and difficult operation in dentistry. The removal of the remaining enamel on the kind of cases I describe as average can be accomplished on any of the anterior teeth in ten minutes if the technic is carefully followed. The ease with which it can be removed with little discomfort to the patient and without any anesthetic is almost a joke. The old idea that the stone should be kept cool is decidedly wrong. A device for applying a constant stream of hot water under pressure directed upon the tooth during the operation is all that is needed. The water should be as hot as the patient can stand, and is constantly drawn away from the mouth with the saliva ejector.

With a half-inch stone, cut about two mm. from the incisal, with a mallet and No. 20 straight chisel, the angles are cut away. This will dislodge the proximal fillings. If on the proximal surface the enamel remains, use a one-half inch knife edge, "Jim Dandy" carborundum stone in a small mandrel, making a line cut from the incisal to the gingival, about one mm. from the mesial and distal on the labial and lingual. This cut is made in the enamel to the dentin, but not into the dentin. Then with an enamel hatchet, or No. 20 chisel, as a lever, break out the enamel. This will denude the proximal surfaces. Make another cut about one mm. in from the enamel margins as before from incisal to gingival and break away. Carry this procedure across the labial and lingual. Then with the end-cutting bur or plain fissure, square up the enamel that remains around the tooth, and with enamel cleavers it will fracture easily. I have a special set of

enamel hatchets, fifty-four in number, designed to reach any angle without laceration, but sufficiently strong to remove the enamel with ease. The trouble with most enamel cleavers on the market is that they are too large to use properly without injury to the gums. Many of the pyorrhea instruments make excellent enamel cleavers when modified slightly.

The enamel rod direction at the gingival under the free margin of the gums compels us to remove it entirely if we are to have a perfect shoulder. Whether we are replacing it properly or not is a question. You can easily see that the thickness we remove and the amount we replace would have a bearing upon the tension given the soft tissues. I took a set of teeth and cut the crown off one mm. from the gingival line, measured each surface and cut off one-half mm. more. I found that the enamel varied in thickness upon each surface, and this variation was constant. It is impossible to reproduce this variation in thickness in a single-banded crown—even if the men knew what the different thickness of enamel on each surface was. Until this is in suitable form for publication, I would urge every man to study this important point and try to reproduce the correct thickness in its numerous variations on his finished crowns.

The Blue Island Specialty Company make a seamless copper band which must be ordered in extra length (one-half or five-eighths inch). It is furnished in twenty-four sizes. Select one which will accurately fit the root at the gingival and is carefully trimmed to the curvature of the gum tissue. This is always done before the shoulder is cut.

The shoulder is cut with a plain fissure bur, No. 56 S. S. W., starting at the labio-gingival angle and cutting across the labial. Then start at the center of the lingual, cut to the mesial and through the proximal joining the labial shoulder. Start again on the lingual, cut to the distal through the proximal and join the labial again. The finished shoulder should be about one-half mm. wide, well under the free margin of the gum. A further refinement of the shoulder is made with a special set of instruments, cutting it so that it will incline inward and upward slightly toward the apex. This is an important detail. Cutting the shoulder is the easiest part of the preparation if the enamel is com-

pletely removed. If the enamel is not removed, the most difficult. I would urge all to study carefully the various finger positions, which will help him to control his instruments.

Toilet of preparation is made with stones and paper disks which are well vaselined. Carefully study the stress of mastication and shape the incisal surface so that you will have a plane at right angles with this force. The angle of wear on the incisal is the guide to angle of the finished preparation. Then with a fine sandpaper disk, well coated with vaseline, polish the surface of the preparation.

The preparation that I use presents no sharp angles except in the occlusal formation at the points that correspond to the occlusal grooves in bicuspid and molars. I believe we thus have a stronger porcelain restoration than if we cut planes at right angles to normal stress of mastication at the junction of the occlusal or incisal and proximal surfaces, which can become cleavage points under certain conditions.

A careful study will bring out the requirements of a proper preparation. On the bicuspid and molars the cusp formation is carried out to overcome the various applications of forces in mastication and thus transfer the strain from the thin proximal surfaces of the porcelain to the preparation made in the occlusal surface at right angles to the applied force.

The selection of the shade should be made at this time so that the porcelain shade-guide tooth can be placed in better relation to the proximating teeth. Wet the teeth and guide tooth while selecting the shade. Hold the lips high so that the red lip will not influence the selection of the color. By holding the lips away we eliminate the shadow and its influence. A chart can be made to note accurately any little peculiarities or defects which you wish to reproduce by drawing outline of the labial surface, dividing it into mesial, distal and middle thirds—incisal, gingival and central thirds. Any third may be further subdivided and the location of a given area recorded.

Before impression of vital teeth is taken the preparation is covered with some form of cavity lining, or you may use chloroform and rosin.

I have always felt that many pulps that have been lost in

the past could have been preserved if we used a cavity lining to prevent the saliva, and possibly infection, from being forced through the tubuli into the pulp in taking our impressions. This applied to cavities for gold inlays as well. When a cavity is lined before taking the impression the patients will never experience severe pain, as many do, when impressions are taken without it. Another peculiar thing is that teeth under gold inlays when set after this precaution are never as sensitive to thermal changes. Think of your histology and your knowledge of pressure anesthesia. Connect all these points with your clinical experience, and I think you will all agree with me that our technic on this important point has been faulty.

The impression of the root is secured by the use of the copper band which was fitted before the shoulder was cut, used as an impression cup. Fill with Kerr's Modelling Compound—dry heat over Bunsen and vaseline slightly, holding the finger over one end, press into position that will be apically of the shoulder—chill with cold water and remove. Into the impression is packed copper amalgam, building a root on the preparation for convenience in handling. Mark the labial or buccal surface. Some men use cement, but I prefer a metal. I have devised a split ring in which I can cast a root by taking impression in cement to which talcum powder is added to destroy its adhesiveness.

Before dismissing the patient the root is covered with a temporary crown made of white base-plate gutta-percha. If the tooth is vital, cement it in position. It serves to protect the tooth from the thermal changes and holds the soft tissues in their proper position.

Sometimes it is advisable to use one of the Silica cements with the Caulk celluloid tooth form and leave the form in position until you are ready to set your crown. The King Specialty Company, Ft. Wayne, Indiana, make an aluminum cup which is furnished in about twenty sizes. I frequently use them on the bicuspid and molars as a temporary covering, setting it with gutta-percha.

The bite can be taken with a hard paraffin wax, like S. S. W. "Tenax," or Kerr's compound. Plaster impressions are more accurate and should be used for the best results.

The most accurate set of models will be secured in the following manner. Run up a cement root of your preparation. It will harden while you are selecting your shade and noting your surface markings. Over this cement root wrap tin-foil and trim to the shoulder. Cover the tin-foil with a thin film of cement to prevent distortion, and place the tin-foil over the preparation in the mouth and take impression with plaster. It will come away in the impression and will give a definite position for the root. Into the tin-foil place a root of moldine which should be as large as possible without interfering with the proximating teeth. Then the impression is poured with a low-fusing alloy, which is furnished by Dee & Company, of Chicago. When the alloy is hard the moldine is removed, and when the amalgam root is ready it is placed into position and plaster is poured around it. The detail and accuracy of this method is surprising, and the time consumed is no more than by other methods. The other jaw is secured in the same way and a model of metal run up. Be sure to get another impression of the root for amalgam root.

The reproduction of root preparation is polished with disks, having it smooth and conical toward the apex and placed in proper relation to the impression. Run up on the articulator. A hole is cut in the plaster model so that the root can be removed without destruction of any of the vital parts of the model. The shape given the root should never be round, as it is liable to rotate.

The matrix is formed by cutting a piece of .001 platinum foil about one mm. longer than the circumference of root at the gingival border; it may converge toward the incisal, and should be about three mm. longer than the distance from the shoulder to the incisal edge. The metal root is removed from the model and the platinum is laid against the labial surface. It is roughly conformed here with the fingers, then burnished to the shoulder with burnishers. Holding the platinum firmly to the root with the second finger and thumb, a triangular piece is cut from the mesial and distal incisal angles; this permits the central portion to be burnished over the incisal and down on to the lingual about one mm.

The burnishing continued around the mesial and distal sur-

faces conforms the platinum to the shoulder as well as to the surfaces. This will bring the ends well around the lingual. With a pair of pliers the ends are grasped and brought together, the excess projecting at right angles from the surface. Trim away all but one mm., then trim the left excess to one-half mm. with cotton pliers—fold the one mm. over the shorter projection and burnish down to the root. Remove, trim all but about one mm. beyond the shoulder toward apex. Reburnish the entire matrix accurately and you will have a matrix which will be a positive fit and which will stand all the handling necessary.

On the shoulder we have four thicknesses of platinum, which is reduced to one by grinding with a fine stone. Otherwise when the crown is finished and the platinum removed we would have a poor fit at that point. Test matrix to see if it can easily be removed before placing on any porcelain.

THE COLOR PROBLEM AND ITS SOLUTION

Unless I can show you how to broaden your sense of color selection, color reproduction will be of little value.

Color and not tooth anatomy is the barrier between the beginner in porcelain work and success. Most dentists have had instruction in dental anatomy, but few understand even the theory of color. Color is a science, to master which one must give time to study and to laboratory experiments. Without a clear understanding of its principles no one should hope to mix haphazardly and reproduce colors accurately.

This subject is a matter of more difficult acquirement when compared with form, which can be measured; its anatomical structure may be investigated.

The system of color depends upon physical measurements made by special color apparatus. Much confusion of color is caused by the inability of most people to express themselves in more than two dimensions—an appreciation of this can be had when, in the study of color nomenclature, we find a classification of names for more than four hundred greys. Unless we study this subject carefully all our sensations are included in the color solid, and none by its scale of hue value and chroma.

Something is radically wrong when we find that men long in practice use from one of three shades in every case. So many have expressed themselves to me that shade so-and-so blends nicely in nearly every mouth. I do not think that all of these are color blind, as the law of averages would not permit of their number. The future will see color standardized. It will be taught in all schools, and we will have definite symbols to express ourselves. Colleges of color will be established where those who wish to specialize in the arts and crafts will secure the proper training.

In the fine arts, the textile manufacturers, even the printers, are giving considerable attention to this matter. It is the only means by which the knowledge of color will live.

In the past we find, in the study of art, that entire schools and ages excelled in color—while in other schools and ages of a later period such knowledge is almost entirely lacking.

Education in this line begins when we recognize the names of certain hues, as red, yellow, green, blue and purple. Red is the color most individuals easily recognize—even savages recognize it and have a name for it. Distinction of color is slow at first. The most notable contrasts are recognized, but the more delicate colors are lost. But after a time spent in exercise and experimental work the delicate colors will be more easily appreciated. The more time one spends in this work the more interest he will take in it and will apply his knowledge in many different ways. When this subject is mastered every color can be recognized, named, matched and imitated.

The first step is to study the theory of color and master its principles. Then mix porcelain as supplied by the manufacturers in various proportions with a pure white, carefully record and keep the buttons; follow this up with the various colors mixed in the same way. Next study the physical nature of light—how it travels, the absorption, refraction and reflection of light on different surfaces. Take a central incisor root preparation on a model, wrap three platinum matrices for the same root. Bake a gingival color of, say, shade five, carefully measure the porcelain mesio-distally, labio-gingivally and inciso-gingivally; have the measurements the same on all three. Then add, say, shade

fourteen as the incisal color, measure as before and have all three identical. After they are baked they should match accurately, as all three were made over the same root preparation on the same model. All three were baked together, each color was carefully measured as applied, and they will be as near alike as it will be possible to make them. Disk all three as smooth as you can with paper disks. Mark one with fine stones and a diamond-point; have the surface markings running mesio-distally. The second one mark in the same way, but have the markings run inciso-gingivally. The third one leave perfectly smooth. Wash with spray bottle and compressed air, place all three in the furnace and glaze. The result will be three different shades due to the action of light on the surfaces. The crown with the smooth surface will be much the lighter, due to the fact that it will reflect a solid beam of unbroken light. The prophylactic specialist who carefully polishes the enamel surfaces of the teeth takes advantage of this fact unconsciously. The patient believes the change is due to the removal of deposits and other material, but the fact is the change is due to the changing of a roughened surface to a highly polished smooth surface.

We cannot match a tooth accurately unless the surface of the tooth we replace acts upon the light similar to its mate in the mouth. We may have the correct colors to reproduce, but unless the surface is broken or smooth, as nature demands, our match is imperfect. If you do not believe this try this experiment: Take one of your patients with two centrals that are perfect, the color is identical. Highly polish one with fine disks, silex, rouge and tin-oxide, then see what you have. The polished tooth is much lighter because the smooth polished surface throws back a solid, unbroken beam of light and the other surface has the imbrication lines of Pickerell or slight roughness which breaks up the rays of light. Another illustration of this is seen in the automobile lights. Most states and all large cities have laws or ordinances to dim the lights. The problem was solved by breaking up the surface of the glass in the headlight.

When I started to experiment with orange porcelain I had a special orange and pure white or colorless porcelain made. I carefully weighed and mixed the porcelain in an agate mortar and

pestle, baking samples of each mix. The first mix was .02 white, .98 orange, and the second .04 white, .96 orange, etc., until I had fifty specimens. By using one of these for a gingival color I can accurately match any gingival color. I firmly believe that the color spoken of in dentistry as yellow in describing artificial teeth is not yellow at all, but orange. The results I have had will bear this out; other men in this same line of work are of the same opinion.

Expert porcelain workers can take six or seven colors and by various mixing reproduce quite accurately. But the beginner will find himself lost in the forest of doubt if he attempts it. We might say take so much of number one, two, etc., by weight and mix—but this would necessitate the use of a balance scale accurately to weigh out and an agate mortar and pestle thoroughly to incorporate it. Then the danger of mixing in particles of dust and other impurities which cause the bulk of trouble for the inexperienced. Few men would take the trouble of carrying out the proper precautions—a guess as to the weights with incomplete incorporation would give the results we too frequently see.

The Justi high-fusing porcelain is the first step to set a standard of colors for the porcelain worker. The colors are accurate and are to be used without mixing. The chart furnished gives accurate directions as to what color and where to use it.

To illustrate the use of the shade chart:

Shade No. 13 according to the shade guide matches the case. Reference to the guide chart shows No. 4 is the body and is placed on the platinum matrix in the position that would correspond to the dentin in the normal teeth—except in the gingival third where the full enamel contour is made. The balance is then built to full tooth contour with No. 13, and the result will be perfect reproduction of shade No. 13. The gingival third will have the full body color; the incisal third the full enamel color, and the middle third a perfect blend due to the thinning out of the enamel color as it is worked to the gingival.

To illustrate variations from the chart:

Numbers 3, 4, 5, 6, 21 and 23 are the body colors to reproduce any shade on the guide. If, in selecting your shade, say No. 13 is good but is a trifle light at the gingival, the next darker

body or No. 5 could be used. In combination with No. 13 enamel it would result in a shade No. 13, slightly darker at the gingival.

The enamel for shade No. 7 is a pure white and could be mixed in any combination to dilute a color.

The first consideration is the material we work with. It is composed of feldspar, kaolin and silex. The two latter will not change at a very high heat—feldspar will liquefy at the heat we subject them to in combination and bind the three together in the form of dental porcelain. To these three substances is added various fluxes which control the fusing point. The larger the percentage of the flux the lower the fusing point.

The color is regulated by the addition of precipitated gold, platinum, oxides of gold, titanium, cobalt, iron, etc.

In the chemistry of porcelain we are interested only in a general way. Exact formulae could be given but they would be of little value—because the variation of silex for instance is so great in various parts of the United States that uniform results could not be secured by what to the inexperienced would be the same formula. I said that feldspar, when heated to the degree to which we subject our prepared porcelain, undergoes liquefaction. It does—but some grades of it cannot be liquefied by the highest heat we can secure with our furnaces. Of course it is not a true feldspar; but it is sold as such. When we understand and appreciate these facts, the solution is to use the manufactured powders which will best suit our individual purposes.

Decomposition by air and dust depends upon the content of alkali—the higher the percentage the greater the decomposition. Dust which would settle on the surface would become the center of disintegration; if the alkali percentage was low this would occur in spots and could only be seen with a microscope—if the percentage was large the disintegration could be seen with the naked eye and appear as large spots which have a tendency to cover the entire surface. The old porcelain workers who used low fusing porcelain will recall the difficulties they had when the enamel was placed on the surface before glazing—the numerous bubbles that would occur.

This was caused in a great measure by fine particles of dust that would settle on the surface or had been incorporated in the

porcelain powders. Keep your porcelain powders covered and all unfinished work under what is known to jewelers as a movement cover on a clean napkin. Keep the muffles free from dust.

Porous porcelain is also caused by baking too fast—various gases which occur in porcelain during the process of baking which forms minute bubbles. It is also caused by baking too slowly. The same trouble occurs in another way—low fusing porcelain can be made from high fusing by grinding and refusing.

If we grind or disk a tooth, crown or inlay, the small particles we grind away is of a lower fusing character and must carefully be cleaned away before the article to be fused is again placed in the furnace.

The shrinkage of the porcelain at the gingival border can be overcome in three ways—by painting shellac over the platinum on the shoulder, by using a thin film of inlay wax in the same position, either of which will burn out clean, leaving a space which will permit the platinum to be reburnished to the shoulder—before filling in with porcelain on the second bake. The other method is to cut it away with the packing instrument before the first bake. It is possible to make a crown in one bake, but not practical. I am of the opinion that the best results can be obtained by three bakes. The final bake and glaze is given when color, contact, occlusion, articulation and surface marking have been checked up in the mouth of the patient.

The model is painted with amyl-acetate to prevent the plaster from absorbing the moisture from the porcelain. If metal models are used no trouble will be experienced on this point. The first color, the gingival is put on with the root in the hand, packing the porcelain to the greatest density, building up slightly beyond the incisal. The porcelain can be best worked by not having it so moist that it will run. Place the root in the model and lay on the incisal color, bringing the porcelain out to full tooth contour and occlusion—remove and add what is needed to the contacts. Carefully brush off loose particles from the carving and exposed platinum.

Another method of placing the porcelain is to wrap a piece of filter paper around the gingival and pour your gingival color into it—the paper absorbs the moisture and permits the porcelain

to be carved; then form another piece of filter paper to the form of the tooth to be reproduced, which encloses the porcelain already carved, into it is poured the incisal color; after the moisture is absorbed carve to occlusion and anatomy. This method is not as accurate; I believe better results can be obtained by having positive control of your colors and place them where you want them.

Many different materials have been used to mix with the porcelain powders to make them workable. Milk, flour and water, alcohol and even vinegar, all of them will work. For experimental work in making test buttons use a saturated solution of starch and gum tragacanth, which is made by the addition of two ounces of tragacanth to two quarts of water; let it stand twenty-four hours and then strain. The porcelain is first mixed with the starch solution, then add the gum tragacanth; you should then have a porcelain of the consistency of putty. Pack it in some form of split mould and bake to what is known as a carving biscuit which is about 600 degrees in the furnace. Remove it and mark it with a porcelain pencil (Dixon's Best 351), and if you make a record of what it contained these buttons will be invaluable to you.

Examine the furnace each time before using. Look at the thermo-couple connections. If it is poor the registration of heat will not be accurate. If the furnace has been moved or handled, see if the needle that registers on the pyrometer is on the figure 0—if not, set it with the corrector. The S. S. W. Electric Furnace with pyrometer and small muffle is the best for this work. The object to be fused is placed in the furnace with the current off. This is a precaution that might save trouble if the current were on. If the tongs were to touch an exposed wire it might result in burning out the muffle. Throw in the knife switch—have the rheostat lever on button No. 1 when 1500 degrees is registered on the pyrometer—close the furnace door. At 1600 the rheostat lever is advanced two buttons at a time until 2350 degrees, which should be reached in about eight minutes. If the muffle is new the lever would probably be on button seven, but as the muffle becomes older it may be necessary to go as high as button twelve or thirteen. If you are in haste, it is perfectly safe

to remove the crown at 2000 degrees, but be careful not to touch it with the furnace tongs. When the crown has cooled sufficiently to handle, place it on the root and reburnish the gingival. Pack the gingival porcelain between that which is already fused and the shoulder. Moisten the model again with amyl-acetate and place crown in the model—if any more porcelain is needed for contour and occlusion it is now added. Place in the furnace and bake to 2450 degrees as before. Remove from furnace and place on the model. Examine carefully contact and occlusion.

The most satisfactory method of baking is to heat the furnace up slowly—a button at a time until the desired heat is reached. For the first bake 2400 degrees, second bake 2450 degrees and the final bake 2500 degrees. The article to be fused is dried out on top of the muffle to eliminate all moisture. When the desired heat is reached the knife switch is thrown out, leaving the Rheostat switch on the button that carried the current to the desired point. Place the crown in the furnace when it drops 500 degrees below the desired point to which you wish to carry it. Throw in the knife switch and close the door until the pyrometer registers the desired heat, then throw the switch and remove the piece immediately. This method is the fastest and most satisfactory. The time will be between three and five minutes, depending upon the current and the condition of the muffle. The results, to my mind, are better as the character of the porcelain appears to be of a better texture than by the slower methods of baking.

The next detail will determine whether you have a good or a poor porcelain crown. You remember the platinum matrix over-lapped the shoulder toward the apex about one mm. for strength. The porcelain is baked flush with this platinum and the platinum is .001 larger than the root; therefore, the finished crown will be that much larger than the root in the mouth—unless it is corrected. The advantage of an overlap is to give the different thickness of enamel on each surface. Some men do not seem to understand we can have a perfect margin between the porcelain and the root and at the same time restore the proper thickness of the enamel we removed. Take a seven-eighths carborundum paper disk and cut away the porcelain and platinum around the gingival with the crown on the metal root. Clean the

crown carefully by using compressed air and spray bottle—follow this up by a good stiff brush and Dutch Cleanser.

The next step is to test the fit in the mouth. To do this do not remove the platinum. The crown is placed in position and a No. 17 explorer (which is a pull explorer) is passed up under the free margin of the gums beyond the shoulder and drawn incisally, passing around the root—if it catches the porcelain is trimmed again until it is perfect. Place in the furnace and carry to 2500 degrees. The matrix is removed by putting in water—then with a fine knife turn over a small piece at the margin—grasp with “K” tweezers and it will usually peel out in one piece.

Roughen the interior slightly with a fine stone and set with Fleck's Cement, holding the crown in position with slight pressure. The bulk of the cement is removed with a straight explorer. The fine particles of cement are removed by a very fine strip, passing it through the mesial around the lingual and back again through the distal. Reverse this and the tape has entirely circled and polished the junction of crown and root.

Before using the strip, the saw-edges should be removed by drawing it over a fine stone. If this precaution is observed, the soft tissues will never be injured.

The possibilities of artistic restorations secured by proper staining of crowns will be a revelation to those who will master a few fundamental principles. I use the word artistic in its broadest sense—displaying perfection of design or conception with an accurate reproduction of nature in our finished piece of work.

We have accepted from the manufacturers for years teeth totally unfit to use in our restoration. The teeth show no sign of wear or age and every patient who needs services of this character is at a period of life when use has left its mark upon the teeth. In justice to all concerned we must not place all the blame on the manufacturer, as the output of any business is based upon the law of supply and demand—it seems to me a serious reflection on the dental profession, to put it mildly.

We hear a lot of criticism of the anatomy of artificial teeth which is true, but when we examine the work found in our patients—what do we see? How near is the anatomy carried out

on the large inlays, large amalgam fillings? What do the crowns we find resemble? Did you ever see the anatomy of the lingual surface of an incisor properly reproduced? How many men even understand the vital importance of the perfect reproduction of this surface anatomy? The usual form given is convex in all directions, which is wrong. The correct form is concave in all directions with a mesial and distal marginal ridge, which is very important as they prevent food from being forced into the embrasures which causes the irritation you always find around crowned anterior teeth unless the lingual surface anatomy is perfectly reproduced.

When we construct a crown on any tooth in which the occlusal or incisal surface is exposed to view we have failed miserably unless we reproduce accurately the correct incisal stain or the discoloration in the occlusal grooves. Our anatomy may be perfect but the crown will stand as a monument to our inartistic ability and will be recognized as such by the layman unless we reproduce the little defects found in the surrounding teeth.

The first thing to do is to make a collection of natural teeth—get as many as you can in good condition, sort them out and arrange them in groups mounted on wax. Keep them in boxes and when you are working have them before you constantly. The greatest artists that ever lived always worked with models, and we as dentists should never put ourselves in a class above them. I do not care how much you may think you know about the anatomy of teeth if you will work in this way it will surprise you how much more you will learn. I have a collection of thousands of perfect specimens of natural teeth and I use them constantly with profit.

I spoke of the roughened surface of the anterior teeth—how the action of light affected the color of the finished crown depending upon the marking you made upon the labial surface. An accurate knowledge of this can only be had by a close study of natural teeth.

About ten years ago I started to stain teeth with the Lennox china colors, but as this is a thin surface stain we had to exercise care so as to not polish it off at the lathe. Some did much better service in the mouth than others, but eventually all were brushed

off, or probably dissolved in the saliva. Most of you may not know it, but glass is slightly soluble in water and it may be that the thin colors which I put on went into solution in later years.

I next used the S. S. W. and Ash's mineral stains with better success, but in jacket crown work, when I wanted to stain the occlusal surface, the area was always where the porcelain was the thinnest. I doubted whether it was advisable to reduce this more by adding a stain, the strength of which was doubtful. I baked up a crown, using one of the mineral stains, and tested its strength. I never used it again on the occlusal. The thought then occurred to me—why not get porcelain, made the same as the porcelain I was using, but colored to match the stains? I had them made and started to test them. They proved satisfactory in every way and I use them in most cases.

One set of special stains has a fusing point of 2450 degrees. The fusing point of all the facing and plate teeth manufactured in this country is between 2450 and 2460 degrees, notwithstanding the fact that some manufacturers claim otherwise. The 2450 degree stains are for this class of teeth. The other is 2560 stain and is used for jacket crown work. These stains are seldom used without mixing. The various colors are white, gray, blue, pink, yellow, green, brown, black and orange; definite proportions by weight are thoroughly mixed with a starch solution (saturate solution of corn starch and water), then add the gum tragacanth (2 ozs. gum tragacanth to two quarts of water—let it stand twenty-four hours and strain); you should have a porcelain of the consistency of putty. Pack it in some form of split mould which is slightly oiled (lard oil), and bake it to what is known as a carving biscuit, which is about 600 degrees in the furnace. Remove it and mark it with a porcelain pencil (Dixon's Best 351). The number marked on the button will always remain. Return to the furnace and bring to the fusing point. Make a record of what each button contained and it will be invaluable to you.

With porcelain jacket crowns that demand stains the area to be stained is cut away before the first bake, and the proper stain as selected from your experimental buttons is placed in on the second bake.

When you wish to reproduce the faint little lines of fracture we so frequently see on the labial surface of the incisors, cut into the porcelain with a cataract knife which is very delicate, bake to 2450 degrees, add your stain before the second bake. White spots can be quite accurately reproduced by baking to full contour on the first bake and then grind away with a stone the area to be stained white. Replace this with the same color you cut away and it will appear as an uncalcified area of enamel unless you cut too deep.

The roughened labial surface is always done after the staining is finished—use fine stone and a diamond graver, which is a pencil-like instrument made of a black diamond. After you have had some experience in surface reproduction you can make a chart. Examine with a Hasting's lens the surface of the surrounding teeth and record the imperfections on the chart. Use a glass and the apparent difficult piece of work will be greatly simplified.

To stain the occlusal surface of a jacket crown after the porcelain is packed and carved to occlusion, cut out the grooves with the cataract knife and bake to 2450 degrees. Add your stain (modified brown), and when the crown is finished it will be the last word in a natural artistic reproduction.

Porcelain technic now is established upon a foundation on which it will live as long as dentistry survives. The S. S. White Company has done us a great service by giving us a furnace which is a masterpiece. Justi's have given us a porcelain with full details as to color reproduction. White's will soon do the same. Many men in the profession have spent hours and money in the perfection of a simplified technic. You have before you probably the best asset to build your practice. Enough experimental work has been done to promise that the near future will give you a new technic for a simplified porcelain inlay, which will fit like a gold inlay, a technic for use with removable bridges and gold plates, a series of experiments to educate your color selection and reproduction, a porcelain inlay for bicuspid and molars which will stand up like a gold inlay, and last but not least, a satisfactory platinum substitute.

SOME BIOLOGICAL, PHYSIOLOGICAL, AND CLINICAL PROBLEMS IN THE TREATMENT OF ORAL SEPTIC FOCI

BY T. SYDNEY SMITH, D.D.S.

IN former papers¹ I have stated that the soft tissues which have been separated from the roots of teeth by pyorrheal destruction will form a vital reattachment and rapidly and permanently cure the lesions, if the teeth are living, and if the tissues are aided by proper surgery. I have also given brief outlines of the treatment necessary to comply with the biological and physiological requirements of the tissues. I shall now present some photomicrographic and clinical evidence to show why, under certain conditions, the reunion of these tissues is biologically possible.

A review of recent dental literature shows that many dentists are now convinced by their own experience that the soft tissues may become reattached to the roots; but it also shows that some still believe in the old theory that the reunion of these tissues is impossible.

Dr. Arthur D. Black,² who has advanced some of the strongest arguments in support of this old theory, recently stated: "In the light of our present knowledge, it seems that we cannot do better than to establish rules for treatment on the dictum of G. V. Black³ that 'suppurative detachments of the peridental mem-

¹a. Permanent Control of Alveolar and Gingival Diseases, *Pacific Dental Gazette*, Nov., 1900, p. 728.

b. The Emetin Hydrochlorid Question in the Treatment of Periodontal Diseases (Pyorrhea Alveolaris), *The Journal of the American Medical Association*, May 8, 1915, pp. 1567-1569.

c. The Successful Scientific Treatment of Periodontal Diseases (Pyorrhea Alveolaris), *Dental Items of Interest*, June, 1916, p. 437.

d. Periodontal Septic Foci, *Cal. State Journal of Medicine*, September, 1916, p. 356.

e. Inflammatory Diseases of the Gingival Margin and Periodontal Membrane (Pyorrhea Alveolaris), *The Dental Cosmos*, Nov., 1916, p. 1239.

² Studies of the Investing Tissues of the Teeth as a Guide for Treatment of Chronic Alveolar Abscess and Suppurative Pericementitis, *The Journal of the Allied Dental Societies*, June, 1917, p. 202.

³ G. W. Black: *Special Dental Pathology*, p. 185.

brane are permanent detachments.'” In explaining why he believes the detachments are permanent Dr. A. D. Black³ says: “The cementum becomes saturated with the products of the suppurative process, the cement corpuscles die; the cementum is practically a necrosed tissue, but it cannot be exfoliated because there is no circulation of blood in cementum as there is in bone.” He believes this condition of the cementum is the chief reason why a reunion of the tissues is impossible, for he continues⁴: “The condition of the cementum is of greatest importance in this connection. To have an attachment of any kind, whether it be normal peridental membrane or a simple adhesion of the overlying connective tissue, the soft tissue cells must necessarily live in physiological contact with the cementum. There is no more prospect of reattachment to pus soaked cementum than there is of the attachment of soft tissue to a sequestrum of necrosed bone. The cementum, by the absorption of the products of the suppurative process, has become a negatively chemotactic tissue; attachment of any kind is out of the question.”

His statement, that the cementum dies when separated from the pericementum, is apparently based on the theory, presented in Black's *Special Dental Pathology*, that the cementum can not receive nutriment from the pulp. In describing the cementum Dr. G. V. Black asserts⁵: “When stripped of its peridental membrane it becomes a dead tissue, no matter if the pulp of the tooth is alive.” We shall see by the accompanying photomicrographs that this theory is not correct; cementum receives nutriment from the pulp as well as from the pericementum, and, therefore, when separated from the pericementum it does not die, so long as the pulp remains vital.

Dr. Arthur D. Black apparently holds the generally accepted opinion that nutriment from the pericementum passes into and through the cementum by osmosis. On this point he writes⁶: “Some one said it was closely comparable to bone. It is, except

³ *Journal A. D. S.*, 1917, p. 199.

⁴ *Ibid.*

⁵ *Special Dental Pathology*, p. 32.

⁶ *The Journal of the American Medical Association*, Feb. 10, 1917, p. 422.

that it has no circulation. Its life depends on the cementoblasts on its surface."

I have not found any explanation of why he thinks nutriment may not also pass into and through the cementum from the pulp by osmosis. But the belief is quite generally held that the first-formed lamella of cementum, which is usually very compact in its structure, forms a barrier to the passage of nutriment.

We shall see that this first-formed lamella is not always compact in its structure, and that, even when it is extremely compact, it does not form a barrier to the passage of nutriment because it is always more or less cancellous, even in fully developed teeth. It is only relatively more compact than the rest of the cementum.

Fig. 1 shows a longitudinal section of young dentin with the first lamella of cementum forming around the granular layer. At this stage of development the cementum consisted of disconnected segments, which showed no tendency to form a dense, structureless lamella.

Fig. 2, which is also a longitudinal section, shows the dentin, with the tubuli almost out of focus and a considerable thickness of normal cementum overlying the granular layer. In this section there is no compact lamella at the union of the dentin and cementum; but, on the contrary, some canaliculi of the cemental lacunae are directly connected with the granular layer of the dentin. A very compact, structureless lamella can be seen on the outer surface of the cementum in this section. I believe all will agree that nutriment passed inward through this dense lamella from the pericementum. If this were the case, it can readily be seen that it was much easier for nutriment from the pulp to pass outward into the cementum; there is absolutely no barrier at the union of the dentin and cementum to prevent this from taking place.

Fig. 3 is a section of dentin and cementum, sufficiently magnified to show the cancellous character of the cementum. In this section the compact, first-formed lamella, which is supposed to form a barrier to the passage of nutriment, can be seen immediately overlying the granular layer. This lamella would no doubt have appeared very dense if it had been stained and magnified

FIG. 1.

Photomicrograph of a longitudinal section taken from near the end of a developing root, which was extracted from the mouth of a child nine years of age. The first lamella of cementum appears in disconnected segments around the granular layer of the dentin.

The photomicrographs used to illustrate this paper were kindly lent by Dr. J. S. Engs of Oakland, California, who prepared and owns the specimens from which they were taken.

FIG. 2

Photomicrograph of a longitudinal section of the root of a cuspid tooth, extracted from the mouth of a woman sixty-five years of age. In this case the first-formed lamella of cementum did not form a barrier to the passage of nutriment from the pulp.

in the usual way, but, with the magnification used in this case, it also is found to be cancellous. Large bundles of fibres extend through this first-formed, compact lamella from the granular layer into the central portion of the cementum.

These sections have shown us that large channels, such as the canaliculi of the cemental lacunae, may pass directly through the first-formed lamella of cementum. It must also be remembered that the sections do not show the full extent of these channels, because they are very irregular in form. Since the sections were cut in a single plane many of the channels must of necessity appear as disconnected dots, when they were, in reality, continuous passages in the specimens from which the sections were cut.

We shall now see that nutriment can pass through this first-formed, compact lamella of cementum when these large channels are absent. Fig. 4 will help us to understand this all-important side of the question. In this section, which shows only cementum, we find two distinct types. Some of the lamellae contain a large number of what appear to be lacunae, while others show no trace of them. These relatively compact lamellae show merely the slightly cancellous formation, which is common to all compact cementum. Nutriment, however, must have passed into and through the one portion just as freely as into and through the other. From this it would seem that nutriment from the pulp can pass through even the most compact portions of the first-formed lamella, because it is always sufficiently cancellous to permit of osmosis, as shown in Fig. 3.

Because air apparently can not be forced through the root of an extracted tooth from the pulp chamber while the cementum is intact, but can readily be forced through dry dentin when the cementum is removed, it is believed by some to prove that nutriment from the pulp cannot enter the cementum. This experiment does not throw any light on the problem of transmission of nutriment. From the accompanying photomicrographs it can be seen that the dentinal tubuli form direct channels through which air could easily be forced; while cementum, on the other hand, does not contain similar channels. Even the lacunae are irregularly distributed, and their branching canaliculi are usually

not connected with those of adjacent lacunae. The transmission of nutriment through cementum by osmosis is a very different thing from the passage of air by mechanical pressure.

We have seen by these photomicrographs that cementum may receive nutriment from both the pericementum and the pulp; therefore, if a portion of the cementum of a living tooth becomes separated from the pericementum, it does not necessarily die, because the pulp can continue to supply it with nutriment. If, then, the involved portion of cementum is living, it is biologically possible for it to permit the soft tissues to form a vital reattachment when its surface is surgically freshened.

Dr. Black's statements regarding the separated soft tissues are rather conflicting. On this point he writes⁸: "What then is the problem which confronts us when we undertake the treatment of such an area with the hope of securing a reattachment? The cementum itself is an entirely passive tissue; no activity may be expected of it. The cementoblasts, the only cells which can lay down new cementum have been destroyed, as have been the fibres of the peridental membrane which would normally be embedded in the cementum." He modifies this statement by saying⁹: "While it may not yet be fully proven that there can be no regeneration of these specialized elements, it seems no more likely than the regeneration of the terminals of either the optic or auditory nerve, or of the nail matrix, or the hair follicles, when these are destroyed."

Later on, however, he admits that the soft tissues could reunite, if the cementum were in a favorable condition. In making this admission regarding the separated soft tissues he states¹⁰: "In cases of chronic pericementitis it has often been recommended that the outer portion of the cementum should be removed with scalers, in the hope that reattachment would occur. Attachment would certainly be possible if the remaining surface were positively chemotactic."

My own clinical experiences have not only verified Dr. Black's statement that the soft tissues can reattach themselves if the cementum is favorable, but they have also thrown valuable

⁸ *The Journal of the Allied Dental Societies*, June, 1917, p. 199.

⁹ *Ibid.*, p. 199.

¹⁰ *Ibid.*, pp. 200-201.

FIG. 3.

Photomicrograph of a longitudinal section of the root of an adult human tooth. The first-formed lamella of cementum, while much more compact in its structure than the rest of the cementum, is sufficiently cancellous to permit of osmosis.

FIG. 4
Photomicrograph of a section of cementum from the root of an adult human tooth, showing two distinct types of cementum.

light on the conditions which make the reunion either difficult or impossible.

During my early investigations, which led to the successful treatment of pyorrheal lesions, it became apparent to me that the cementum receives nutriment from the pulp, and that it may continue to live when a portion of it is separated from the pericementum, as is shown by the accompanying photomicrographs. I also became convinced that although many inflammatory and atrophic changes occur in the separated soft tissues, there are only two conditions likely to interfere with the reunion of these tissues to the cementum after the proper surgical assistance has been given. These are the infolding of epithelium and enough destruction of the tissues to prevent them from remaining close to the cementum while they are healing. For some time I met with repeated failures to secure a reunion of the tissues. Although confronted with my own failures and the general opinion of the scientific world that these tissues could not reunite, I never doubted the biological possibility of the reunion. I believed my surgical technic was at fault. This opinion proved to be correct, for, in 1903, a deep, chronic pocket which I had treated surgically healed so rapidly and perfectly that there could be no doubt that a reunion of the tissues had taken place. For some time I could not repeat this result, but eventually I secured another perfect reattachment. The third one came more easily. From that time on the percentage of reattachments gradually increased as I developed and improved my surgical technic. I then tried to discover why I still met with some complete or partial failures. The results of this study are extremely important, for it is just as necessary to know what to expect and what to do when the condition of the tissues is unfavorable as when it is favorable.

From my experience it would seem that the cementum may not be a passive tissue, as claimed by Dr. Black. On the contrary, it seems to play an important part in the reunion of the tissues. I have found that if the cementum is removed from a portion of the root, leaving a sensitive surface beneath the margin of the gum, the soft tissues do not readily reunite to that surface. They

reunite to the portion of the root which still has a covering of cementum; but they only gradually become reattached to the margins of the sensitive portion, thus reducing the size of the pocket, if repeated gentle surgical assistance is given. Sufficient time should elapse between these subsequent operations to permit any reunion of the tissues which is taking place to become well established, otherwise one might constantly detach the soft tissues without knowing it. While the attachment of the tissues is never very perfect in these cases, and the overlying gum margin is frequently red and easily irritated, the depth of the pocket can usually be sufficiently reduced to permit us to retain the tooth with comparative safety if constant prophylactic care is given. When teeth of this character are retained, and I believe many of them should be, the patient should be told why the gums do not reunite perfectly at these points. Even then one runs the risk of having his work unfavorably criticised; dentists who do not understand the treatment of periodontal diseases point to these cases as proof that pyorrheal lesions cannot be cured.

Originally I believed that the soft tissues could reunite to a surgically-freshened, living root, whether the surface be cementum or dentin. I based this opinion on the fact that in cases where absorption has removed a portion of cementum and dentin near the end of a living root the cementum frequently refills the space and affords attachment for the pericementum. I also knew that cementum could form over the dentin, if the root of a healthy tooth were broken off deep enough under the gum to permit the tissues to heal rapidly and perfectly over it. I have found by experience, however, that the soft tissues do not reunite to exposed dentin in pyorrheal pockets, as they do to cementum; and when they do reunite to the root in these cases it appears to be due to the fact that cementum has re-formed over the dentin from the margins.

It is probable that many of the failures which investigators have met with in the treatment of pyorrheal pockets have been due to the removal of cementum from the roots while attempting to remove the calculus. Cementum is usually so thin on the gingival third of the root that one must operate with almost a microscopic degree of accuracy in order to remove every trace

FIG. 5.
Photomicrograph of a section of young dentin, showing the opportunity which is afforded for the development of bacteria within the body of the dentin, after the pulp has been destroyed.

of calculus and surgically freshen the surface of the cementum, without completely removing portions of it. The operation is especially difficult in cases where the calculus is so hard and so thoroughly united to the cementum that it cannot be broken away with the instruments, but must be scraped off gradually. Unless the surgeon has had much experience and has an extremely accurate touch, he will be likely to cut away completely the cementum at some points and to leave traces of calculus at others. Much of this irreparable damage can be avoided if dentists will develop their sense of touch with the instruments by experimenting on the roots of freshly extracted teeth which are coated with calculus; or, better still, if they will work on the roots of affected teeth which are to be extracted. One should not undertake the treatment of teeth which are to be saved until he has learned to differentiate more perfectly by the touch of the instruments between cementum and calculus than would be possible by the aid of a reading-glass. The danger of removing portions of cementum is increased by the fact that it varies greatly in thickness at different points around the circumference of the same root. If one studies only highly magnified sections of cementum, such as have been presented in this paper, he will be likely to think that it requires considerable effort to remove it. I would, therefore, advise all who undertake the treatment of pyorrheal lesions to make longitudinal and cross sections of roots, and to study the cementum with a reading-glass. If this is done they will not make the mistake recently made by a teacher in one of our dental colleges. While demonstrating his method of treating the roots at a public clinic, he was using the instruments so severely that an observer ventured to ask him how much of the root he was removing. He replied by saying, "About the thirty-second of an inch."

Although the cementum does not die as the result of the separation of the pericementum by pyorrheal conditions so long as the pulp remains vital, portions of it may be completely removed by acids, apparently of bacterial origin, if the tissues do not reunite rapidly, and remain highly inflamed after the calculus has been removed from its surface. Clinical observations convince me that inflamed, unhealthy gums are always accompanied

by an acid condition which has a destructive action on enamel, or exposed surfaces of cementum and dentin. These acids, however, seldom attack root surfaces which are beneath the margin of the gums in pyorrheal pockets where no attempt has been made at treatment, because they are usually protected by serumal deposits. But if, for any reason, the soft tissues fail to reunite rapidly to the roots after the calculus has been surgically removed, the cementum becomes exposed to the action of these acids, unless its surface is quickly recoated and protected by a new precipitation of serumal calculus. Perhaps the only exception to this is where the reunion has been prevented by the infolding of epithelium. Great care should be exercised, therefore, not to leave a trace of calculus or of carious margin of bone in the bottom of the pocket, as this would prevent healing and endanger the cementum.

Apparently serumal deposits do not continue to protect the roots long after the recession of the gums exposes them to the full action of the fluids of the mouth. It is a common experience, even in cases where no attempt has been made at prophylaxis, to find that the serumal deposits have not only been removed from the exposed surfaces of roots by acids, but that deep erosions have occurred.

Clinical results apparently disprove Dr. Black's theory regarding cementoblasts. Since the soft tissues reunite readily to the roots, if the cementum is favorable, it would seem that the cementoblasts are either not entirely destroyed in the detached portion, or else that the reunion does not depend upon these original, highly specialized cells.

Be this as it may, the separated soft tissues should not be bruised or lacerated while the surface of the cementum is being prepared, because it is extremely important that reattachment should take place rapidly. When the tissues are injured in this way they do not remain close enough to the cementum, and the amount of repair required is so great that they cannot reunite easily; they merely granulate slowly from the bottom of the lesion. This failure of the tissues to reunite rapidly permits the surface of the cementum either to become re-coated with calculus and debris, or to be seriously injured by the action of acids. Even

if reattachment does, eventually take place after the tissues have been bruised and lacerated, the amount of cicatricial tissue formed causes the margin of the gum to recede unnecessarily.

Some men not only ignore these biological requirements of the tissues while preparing the surface of the cementum with surgical instruments, but add to the damage by bruising them still more with sticks and strips, and even deliberately poke abrasive materials into the fresh wounds. They defend these acts by saying that this treatment does not interfere with healing. When healing occurs after such treatment, it is due to the wonderful recuperative powers of the tissues; they simply heal in spite of the damage which has been done to them. It is deplorable that dentists, after having received scientific training, willingly pay these men big fees to teach them how to do these absurd things. The instruments should be controlled with such a degree of accuracy while the surface of the cementum is being prepared that there will be very little hemorrhage from the surrounding tissues, and even the use of a local anesthetic will not be required. The public should be informed that painful treatment is not only unnecessary, but very harmful.

I have found that in cases where the cementum is intact, but where the infolding of epithelial tissue prevents the reunion from becoming perfect at the margin of the pocket, it is better to let the tissues reunite as far as possible after the first operation, and then occasionally to freshen surgically the tissues at the bottom of the remaining shallow pocket. In this way they will gradually become reunited. Tissues which are prevented from reuniting by the infolding of the epithelium remain normal in color, and thus can be easily distinguished from tissues which fail to reunite because of the removal of the cementum.

Soft tissues do not reunite perfectly to pulpless teeth. Sometimes there appears to be a slight reunion at the bottom of the lesion which suggests that the cementum may continue to live slightly beyond the line of separation. If the pockets are not very deep, pulpless teeth can be improved sufficiently to make it advisable to retain them when the apical conditions are favorable.

It is advisable to have all badly affected teeth radiographed before the treatment is commenced. With the aid of good radio-

grams one can see the extent of the lesion, and also judge whether or not the form of the roots will permit of successful surgical treatment. In studying radiograms of teeth which have been treated for pyorrheal conditions, one should bear in mind the fact that the amount of bone found may not correspond to the reattachment of the soft tissues. In one case a considerable amount of new bone will form around the root when the soft tissues become reattached. In another case where the soft tissues are reattached just as perfectly, the bone may not be restored to any appreciable extent. If the soft tissues are reattached the lesion may be considered cured, even though the radiogram may show the absence of new bone.

Dr. Black not only contends that merely palliative treatment is all that can be given to teeth which become affected with pyorrheal conditions, but he even advises the removal of the separated soft tissues. His statement on this point follows¹¹: "In cases of chronic pericementitis, pockets of shallow depth and in certain positions will be favorable for palliative treatment. We will reduce the depth of some of these by cutting away the overlying unattached tissue; then we will train the patient to keep them clean by washing them with salt solution, using a syringe designed for the purpose."

In this statement there is the complete discouragement of all attempts to cure pyorrheal lesions, and irreparable damage is being done by dentists who are following such advice. Too much emphasis cannot be laid on the need of preserving the original form of the soft tissues around the necks of the teeth. When normal these tissues form a perfect series of inclined planes which permit food to slide over the supporting structures without injuring them. These tissues are even benefited by the friction they receive from the passage of food, if they are normal in form, because they are both cleansed and stimulated by it. When the septal points are shortened, or the thin margins of the gingivae are removed, these tissues form an obstruction to the passage of food, and are bruised and injured instead of being benefited by it. I have found that we can not only retain these tissues in the form in which we find them, by assisting them to reunite to the

¹¹ *The Journal of the Allied Dental Societies*, p. 202.

roots, but that lost portions can sometimes be partially restored. It is quite a common experience to have the septal points almost perfectly restored, especially if the patient is under thirty years of age. I have even had as much as four millimeters of the denuded labial surface of a root re-covered by the gum, when all of the structures were in a favorable condition. The attainment of such a result, or even the retention of the gum margins exactly at the point where we find them, is surely far better than deliberately removing them. When we remove portions of the soft tissues we create a condition which is extremely unfavorable for the teeth themselves. Exposed portions of the roots are very difficult to care for, because many of them are hard to reach with the tooth brush or any device that may be employed by the patient; and even where the surfaces can be reached the porous character of the tissues permits them to retain debris, and favors the rapid development of bacteria. Root surfaces are not capable of taking as high a polish as enamel. The difference is almost as great as that which exists between granite and sand-stone. When the roots are exposed the patient must struggle hard all the rest of his life to prevent them from becoming hypersensitive or eroded.

The more carefully I study the cases which fail to reunite after surgical treatment, the more I am convinced that the hindrance is a local rather than a systemic one. The trouble invariably proves to be either in the gum or in the tooth tissues themselves. Even in cases of advanced diabetes or pernicious anemia the soft tissues have reunited to the roots when the local conditions were favorable.

The treatment of apical septic foci arising from death of the pulps presents a very different problem from that which is involved in the treatment of pyorrheal lesions around vital teeth. In apical cases we are dealing with pulpless teeth; hence we should not expect the soft tissues to reunite if a portion of cementum at the apex of the root is denuded. The question arises, then, as to whether we are creating a safer condition if we resect the end of the root. If the case is one which demands radical treatment I believe it is better to curette the infected area, and merely to smoothen the surface of the involved portion of cemen-

tum without exposing the dentin. Resection is unwise in the light of our present knowledge, unless we can find some method of first sterilizing the dentin and filling all of the tubuli and spaces of the granular layer with a permanent material which will be non-irritating to the soft tissues. It would not be sufficient merely to fill the pulp canal, no matter how thoroughly this were accomplished, because the dead dentin is so porous that it furnishes an ideal spot for the development of bacteria. Fig. 5, which represents a highly magnified section of dentin, will help us to understand the problem which confronts us when we expose dead dentin in resecting a root. Since the soft tissues cannot grow to dead dentin, and the smallest branches of the dentinal tubuli are large enough to contain bacteria, the irrationality of resecting enough of the root to expose this structure, when only the pulp canal is filled, must be apparent.

I have found by years of experience that correct prophylactic care will not only prevent pyorrheal conditions, but will also keep the teeth almost free from caries, and thus avoid the danger of death of the pulp and the apical complications which follow. Correct prophylactic care, however, is certainly not the kind which is so universally practised at present. But this side of the question must be dealt with in a subsequent paper.

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DENTAL PROCEDURES AMONG THE NATIVES OF AUSTRALASIA, MELANESIA, POLYNESIA, AND MICRONESIA

BY BENE VAN RIPPEN, D.M.D.

THE subject of procedures involving tooth mutilations and extraction of the elements in accordance with a local custom or demand in order to obtain favors from a deity, to assure a rebirth or to comply with the ritual upon entering into manhood, are of particular interest to the investigator not only on account of the *modus operandi*, of their close relationship with the natives' life and mental reasoning, but also of interrelationships of the different tribes.

The different authors quoted are accepted as being reliable, but the writer does not claim the subject matter to be infallible. Some of the travelers were men well trained in the observance of happenings in primitive society, while others were mere passers-by and related their experiences without going into the detail as to the why and wherefore. This may make the record more or less incomplete.

A tabulated review is presented in order that the reader may more easily ascertain where the different customs mentioned occur.

Indonesia has not been touched upon in this paper, but will be treated in a subsequent article with Asia.

Oceania, the fifth grand division of the globe, embraces the continent of Australia and the islands of the Pacific Ocean east

to Easter Island (109 degrees west). These islands are generally grouped into five great divisions:

OCEANIA.	Australasia.	{ Tasmania, Australia, New Zealand.
	Melanesia.	{ New Guinea, Bismarck Archipelago, New Caledonian Island, Solomon, Santa Cruz, New Hebrides, Loyalty Groups.
	Polynesia.	{ All Islands within Ellis Island (west), Palmyra (north), Oow Archipelago (east) and Fiji Islands.
	Micronesia.	{ Remaining Islands of the Pacific, including Mari- anna and Ladrone (west), Hawaiian (east).
	Indonesia.	{ Molucca Islands, Java, Borneo, Sumatra, Celebes, Philippines.

The Australian natives are of a very low standard in human culture. Their two outstanding interests in life are their stomachs and ceremonial exercises—the latter being extensively practised.

Tooth-knocking-out ceremonies are of greater importance among these people than among the natives of other hemispheres. Thomas (1) was able to distinguish three classes of ceremonies in Australia, among which he classified—firstly: “the eastern and extreme western characterized by knocking out of teeth and similar mild observances; secondly: a narrow area in the inside of these two regions, where circumcision prevails; thirdly: the great central area where circumcision is only the preliminary to a more severe operation known as Mica.”^a

The tribes, it may be noted, also practise the knocking out

^a Howitt claims that the knocking out of teeth is the principal ceremony amongst the tribes of Eastern and Southeastern Australia.

1. N. W. Thomas: *Natives of Australia*. London, 1906, p. 184.

of teeth in addition to other ceremonies. It is impossible to give a full description of the different customs, which are the great event in the life of the Australian, for there are numerous varieties even in each particular area. These ceremonies are given different names—the best known being perhaps “Cora,” used by the Kamilaroi; others are Burbung, Dora, Jeraut, Keebara, etc. An important part is played all over Australia, and far beyond its limits, by the little implement known as the bull roarer, whose function seems to be to warn the women and children that sacred mysteries are being performed, for in most tribes it means death to a woman to see the initiation ceremonies or even the bull roarer itself, which is sometimes called the Grandfather, or sometimes the voice of Daramulum, or other god.

Initiation ceremonies are seldom peculiar to a tribe. There are, however, peculiar regulations in some cases, as, for instance, the persons by whom the initiation shall be performed. A boy is not necessarily initiated, for example, by a member of his own class or phratry. The summons to the initiation ceremonies is issued by the tribal council and dispatched by the hand of messengers. The preparations take several months, as a rule, and there may be more than one set of messengers. The ceremonies consist of serious dances and performances with comic interludes, the object being to impress the boy and show him that he has reached the turning point in his career.

According to Dr. Howitt (2), the serious portion is “dramatic representations of the cardinal sins, which are ironically recommended to the boys for initiation; they are also symbolic acts, such as the movements of the hands on the part of the men and medicine men to signify that magic power is passing from them to the boys.”

Dr. Howitt continuing his description shows the next act (3) as the “preparation of a figure of Daramulum, the god or demigod, who is believed to preside over the ceremonies. Ten men were then dressed in ceremonial dress, stringy bark fibre around their legs and arms, with the bands crossing each other.

2. A. W. Howitt: *Native Tribes of South East Australia*. Journal Anthr. Inst., Vol. 37, 1907; pp. 268-278.

3. N. W. Thomas: *Natives of Australia*. London, 1906.

Wigs of the same material are placed on their heads. Cords also draw back the upper and lower lips, completing the disguise." After some further dramatic representations, "a man covered with charcoal as representative of Daramulum emerged from some bushes; dancing all the time, placed his lower incisor teeth to the upper incisors of one of the boys and forcibly pressed upwards; then placing a stone chisel against the tooth struck a blow with his mallet; after some seven blows the tooth fell out and it was given to one of the old men." The boys were instructed that they must show no sign of pain and, according to Howitt, the one in question evinced no more sensibility than a stone. The only sign of suffering was an extraordinary quivering of the muscles of the leg. In another case, when thirteen blows with the mallet were necessary before the tooth came out, the boy yelled, but the noise was drowned by shouts from the men around. The next proceeding was to invest the boy with men's attire.

The extracted teeth were carefully preserved. Any rash use of them might result in serious consequences to the boy to whom they had belonged. Dr Howitt carried off two of the teeth extracted at the ceremony just described and some twelve months afterwards a messenger came two hundred and fifty miles by foot to say "that one of the boys was ill and to inquire what he had done with the teeth."

Cameron (4), who was present at a Bora among the Wonghi tribe in New South Wales, relates his experience, which agree fairly well with those of Howitt. A few differences in detail were noted—one of them being the digging of two holes in the ground, into which were placed the youth's feet in order to stabilize him, but incidentally to prevent him from kicking the operator. After the Bora is over, the boys are shown to their mothers and sisters, who are very proud to see their sons raised to manhood.

"Among the Eastern tribes (5) the custom of knocking out teeth was not universal, and the initiation ceremony was

4. A. L. P. Cameron: *Notes on Some Tribes of New South Wales*.
Journal of the Anthr. Inst. of Great Britain and Ireland,
Vol. XIV, p. 357.
5. N. W. Thomas: *Natives of Australia*. London, 1906, 6. 189.

found in a very simplified form only. The "Jibauk" rites of Victoria consisted in isolation of the boys, who were daubed with mud and had their hair cut so as to resemble a hog-mane, in a camp some two hundred yards away. Their food they obtained by begging and they received no special instruction in tribal laws."

Parker (6) says that the knocking out of a front tooth is not invariably a custom among the Euahlayi tribe, but when it is performed it constitutes a part of the initiation ceremonies. "The boy was blindfolded and almost deafened by the whining of 'Gayandi.' This done, a wirreenum^b chanted to the boy, one chant being as follows:

Now can you meet the Boorah^c spirit,
Now will he harm you not.
He will know his spirit in you
For this is the sign—
A front tooth gone.
That is his sign.
He will know you by it.

"Some of the wirreenums buried these teeth by the Boorah fire, others carefully wrapped them up to keep them as charms, or to send to other tribes, each according to the custom of each individual tribe.

"This all over, once more there was a marching and chanting around the fire, then the boys were taken away and given food for the first time since they had left their mothers."

Another custom, more horrible than those mentioned, is also (7) reported by the same author. "To live, a child must have an earthly father; that it has not, is known by its being born with teeth present. In that case it is a spirit baby, and they are usually dispatched to Waddagudjaelwon and sent by her to hang promiscuously on a tree."

^b A wirreenum seems to be one of the officiating members at the ceremony.

^c "Bora" or boorah is a meeting place for initiation.

6. K. Langloh Parker: *The Euahlayi Tribe*. London, 1905, p. 74.

7. Ibid: p. 51.

These natives (8) used to have very good teeth, "they always rinsed their mouths after meals, and often used powdered charcoal to purify them. The younger generations have discarded the mouth rinsing habit and not having attained to the use of the toothbrush resulted in a gradual deterioration of the teeth."

The purpose of the tooth knocking out customs may be emphasized by quoting Haggarth (9), who during his long sojourn among the natives relates the following incident: "An Australian who had been living on one station for a long time said one day, with a look of importance, that he should have his teeth knocked out."

Gason (10), visiting the natives of South Australia, speaks of the Dieyerie tribe having a ceremony called "Chinchinchirrie" (extraction of the teeth).

"From the ages of eight to twelve years, the two front teeth of the upper jaw are taken out^d in the following manners: Two pieces of the Cooyamurra tree, each about a foot long, are sharpened at one end to a wedge-like shape, then placed on either side of the tooth to be extracted, and driven between as tightly as possible. The skin of a wallaby in two or three folds is then placed on the tooth about to be drawn, after which a stout piece of wood, about two feet long, is applied to the wallaby skin, and struck with a heavy stone, two blows of which are sufficient to loosen the tooth, which is then pulled out by hand. This operation is repeated on the second tooth. As soon as the teeth are drawn, a piece of damp clay is put in the holes left by their extraction to stop the bleeding. The boy or girl (for this ceremony is performed on either sex) is forbidden to look at any of the men whose faces may be turned from them, but may look at those in front of them, as it is thought that their mouths would close so tightly that they would never again be able to

^d N. W. Thomas: *Natives of Australia*, p. 184. This observer says that the teeth extracted among this tribe are the *two lower front teeth*.

8. Parker: p. 125.

9. H. W. Haggarth: *Recollections of Bushlife in Australia*. Page 103.

10. S. Gason: *The Native Tribes of South Australia*. Adelaide, 1879, page 266.

FIG. 1.
Teeth Extracted at Yuin Kuringal, and Implement Used
A. W. Howitt's "*The Native Tribes of Southeast Australia*,"
London, 1904, p. 562

FIG. 2
Tooth Knocking Out Among the Kaitisch Tribe
Spencer & Gillen's "*Across Australia*," London, 1912, Vol. II, p. 217

eat if they looked toward the men whose backs are turned from them. For three days the prohibition is maintained, and then removed. The teeth drawn are placed in the centre of a bunch of emu feathers, smeared with fat, and kept for twelve months or thereabouts, under the belief that, if thrown away, the eagle hawk will cause longer ones to grow in their places turn up the upper lip, and thus cause death."

The Dieyerie, on being questioned, could assign no reason for thus disfiguring their children, than "that when they were created the Mooramora knocked out two front teeth of the upper jaw of the first child, and, pleased at the sight, commanded that such should be done to every male or female child for ever after."

This author witnessed this ceremony on several occasions, but, in spite of the painful procedures, he never saw a boy or girl make the slightest movement during the "operation."

Spencer and Gillen (11) mention the Warramunga of Central Australia. They, although practising the custom of knocking out of teeth, have an entirely different ceremony. When a girl's tooth has been knocked out as a solemn exercise, it is pounded into small fragments and placed in a piece of flesh, which has to be eaten by the girl's mother. When the same rite has been performed on a man, his powdered tooth must be eaten by his mother-in-law. The age limit among these people is apparently beyond fourteen, as found among most of the other tribes.

The knocking out of teeth (12) is the principal ceremony in Eastern and Southeastern Australia, and it is often practised, though not as an initiatory rite, by the Central tribes, with whom the essential rites are circumcision and subincision.

Frazer (13) suggested the hypothesis that "parting with a vital structure of one's self should constitute an endeavor to insure another life after death."

The durability of the teeth, compared with that of other parts

11. **Spencer and Gillen:** *Northern Tribes of Central Australia*. London, 1899, page 593.
12. **A. W. Howitt:** *Native Tribes of Southeast Australia*.
13. **Sir J. G. Frazer:** *The Golden Bough*. Vol. I, page 96.

of the body, might be sufficient cause with a savage philosopher for choosing this portion of the body on which to pin his hope and faith of immortality.

The evidence at our disposal certainly does not suffice to establish this explanation of the rite, but there are some facts which point in that direction. In the first place, "the extracted tooth is supposed to remain in sympathy with the man from whom it has been removed; and if proper care is not taken of it, he may fall ill." With some of the Victorian tribes the practice was for the mother of the lad to choose a young gum tree and to insert her son's teeth in the bark, at the fork of the two uppermost branches. Ever afterwards the tree was held, in a sense, sacred. It was made known only to certain members of the tribe, and the youth himself was never allowed to learn where his teeth had been deposited. When he died the tree was killed by fire. (14) Here we may see that in a certain fashion the tree was bound up with the life of the person whose teeth it contained, and so was destroyed upon his death. Among the Central tribes "the extracted tooth is thrown away as far as possible in the direction of the spot where the man's mother is supposed to have had her camp in the far off legendary time known as 'alcher-inga.' May not this be done to secure the man's rebirth in that place?"

In the Granji tribe the extracted tooth is buried by the man's or woman's mother beside a pool, for the purpose of stopping the rain and increasing the number of water lilies that grow in the pool. (15) "Thus the same fertilizing virtue is ascribed to the tooth which is attributed to the foreskin severed at circumcision, and to the blood drawn at subincision. Why the extraction of teeth should stop rain I don't know, and can not guess. Curiously enough, among the Central tribes generally, the extraction has a special relation to rain and water. Then by the Arunta it is practised primarily by the members of the rain and water Totem; and is nearly obligatory with all the men

14. W. Blandowski: *Personal Observations Made in an Excursion Towards the Central Parts of Victoria*. Melbourne, 1855, page 72.

15. Spencer and Gillen. Page 594.

and women of that totem, whereas it is merely optional with members of the other clans." Furthermore, the ceremony is always performed among the Arunta immediately after the magical ceremony for the making of rain. (16) In the Warra-munga Tribe the knocking out of the teeth generally takes place towards the end of the wet season, when the water holes are full and the natives do not wish any more rain to fall. Moreover, it is always performed on the banks of a water hole. The persons to be operated upon enter the pool, fill their mouths with water, spit it out in all directions, and splash the water over themselves, taking care to wet thoroughly the top of their heads. Immediately afterwards the tooth is knocked out. The Chingilli also knock out teeth towards the close of the wet season, when they think they have had enough rain. The extracted tooth is thrown into a water hole in the belief that it will drive rain and clouds away. (17) This is noted, without attempting to account for this association between the extraction of teeth and the stopping of rain.

The natives of Cape York Peninsula in Queensland use the extraction of the tooth to determine both a man's totem and the country to which he belongs. While the tooth is being knocked out, they mention the various districts owned or visited by the boy's mother, her father or other relations. The one which happens to be mentioned at the moment the tooth comes out is the country where he will have the right to hunt and to gather roots and fruits. (18) The bloody spittle after the extraction is examined by the old men, who trace some likeness between it and a natural object, such as an animal, stone or plant. Henceforth that object will be the young man's "ari" or token. (19) It seems probable that among the Cape York natives the custom of knocking out teeth is closely associated with a theory of incarnation. Perhaps the same theory explains a privilege enjoyed by the Kamilaroi tribe of New South Wales. They claimed a superiority over the surrounding tribes, and enforced their

16. **Spencer and Gillen.** Page 451.

17. **Ibid.** Pages 592-594.

18. **A. C. Haddon:** *Head Hunters.* Page 221.

19. **Ibid.**

claim by extracting from them the teeth knocked out at puberty. But the Kamilaroi knocked out their own teeth also and therefore the mere extraction of teeth was no sign of inferiority. Probably the extracted teeth brought to the possessors a control over their former owners, not during life alone, but also after death, so that armed with them the Kamilaroi could help or hinder the rebirth of their departed friends or enemies.

Another observer (20) mentions tribes of New South Wales who knock teeth out during initiation exercises, during the performance of which the boy is seated on the shoulders of a man, on whose head flows the blood which is forbidden to be wiped away. The blood is not allowed to reach the ground for reasons unknown to this traveller.

That some of these savages had a "cure" for toothache may be shown by quoting Dawson (21), who informs us that in some tribes they apply a heated spear thrower to the cheek. This is then cast away and the toothache goes with it in the form of a black stone shaped like a walnut and called "Karriitch." Stones of this kind are found on the banks of the Mount Emu creek near Darlington. They are "carefully preserved and are considered an infallible remedy for toothache."

Cameron (22), who studied several tribes of New South Wales, makes some very interesting statements regarding the subject under consideration. He says, "The initiation ceremonies are secret and only men and those to be initiated are allowed to be present and anyone not entitled is killed. Women are never allowed to witness any part of the initiation. They are not even allowed to see the instrument which is being played upon during the exercises. Any woman seeing any part by accident or otherwise is put to death. The "medicine man" of the tribe is the master of the ceremonies. The youths, before the ordeal, are sent a short distance to meet a being "Thurem-

20. D. Collins: *Account of the English Colony of New South Wales*. London, 1798, page 580.

21. J. Dawson: *Australian Aborigines*. Melbourne, 1881, page 59.

22. A. L. Cameron: *Notes on Some Tribes of New South Wales*, 1885, page 357.

FIG. 3
Tooth Knocking Out Ceremonies, Woman Putting Water on Her Head,
Warramunga Tribe
Spencer & Gillen's "*Across Australia*," London, 1912, Vol. II, p. 389

FIG. 4
Arunta Woman Showing a Superior Right Central Incisor Missing
Spencer & Gillen's "*Across Australia*," London, 1912, Vol. I, p. 168

FIG. 5
Young Woman Arunta Tribe, Showing Left Superior Incisor Missing
Spencer & Gillen's "*Across Australia*," London, 1912, Vol. 1, p. 197

lin." This being, it is said, takes the youth away, cuts him up, after which he restores him to life and knocks out a tooth. Their belief in the power of Thuremlin is undoubted.

Thuremlin is probably a dialectic variation of Daramulum (the being who lives in the sky, instituted the rites, and superintends their performance). This is the reason that thunder has such a sacred meaning—it being believed that Daramulum is sending down rain. The sound of the bullroarer is an imitation of this thunder and therefore has also a sacred character. Rain means to the savage a greater amount of lizards, snakes and other reptiles used as food, and also a greater abundance of roots and herbs.

The custom appeared in "Queensland (23) among the Bidhala, but was not observed among the Wapa. The women of the Bidhala (coast blacks) in some districts had one of the front teeth purposely knocked out. It seems that it was not in vogue among the men or boys."

That some of the tribes filed teeth (?) may be shown by a quotation from Reid (24), who says, "Judging from their long sharp teeth, the presumption is that they have descended from a race of cannibals, perhaps the only ones left alive of the tribe."

This is to be taken for what it is worth—it being the only case where pointed (?) teeth are mentioned, and no tribe or place being given makes one more cautious about accepting the facts stated.

The number of teeth extracted and sexes of the subjects differ in several tribes. Some tribes extract one (25), and sometimes two, of the front teeth of the males, when they arrive at the age of fourteen. "Some tribes practise circumcision (26), and those who have this practice, do not seem to extract the teeth."

23. John Mathew: *Two Representative Tribes of Queensland*. London, 1910, page 108.

24. J. Reid: *Wild Australian Children*. New York, 1864, page 6.

25. Sir T. L. Mitchell: *Journal of Expedition in New South Wales*, page 235.

26. *Ibid.* Page 258.

Spencer and Gillen (27) give an interesting account of a ceremony in vogue among the Warramunga tribe as illustrated by the accompanying reproductions.

"Not far away from the main camp there was a pool of water, by the side of which the ceremony of knocking out young women's teeth was performed. Fortunately, we had the opportunity of seeing this done. The pool was about a quarter of a mile away from the ceremonial ground where the men were performing, so the women had to walk a long way round lest they should, by chance, see the men preparing for a ceremony. When we reached the waterhole we found about thirty women and children gathered together. They had lighted a fire, as the water was cool and the air chilly.

"Four of them, who were to be operated upon, went into the water, two by twos. First of all they filled their mouths with water, spitting it out after a short time. Then they threw water over their heads and, having done this, came out on to the bank, where the other women were watching and waiting for them. Each one, as soon as she had come out, lay down on some gum-tree twigs, and then one young woman pushed the gum back from the tooth with a small piece of bone, and another immediately afterwards knocked the tooth out with a pointed stick which she struck smartly with a stone. She was an 'excellent dentist' and, except in one instance, the tooth came out with the first blow. As soon as the operation was over, the patients put a small pad of heated gum leaves in their mouths, which is supposed to soothe the pain. They also say that the cold water numbs the gum and prevents them feeling the blow very much.

"We were wondering what would be done with the tooth. In the Kaitish tribe it is thrown away in the direction of the camp which the patient's mother inhabited during the Alcher-inga; in the Warramunga its fate is very curious. If it be a woman's tooth, as it was on this occasion, it is taken back to the camp, where it is pounded up between two stones, mixed with a little meat of some kind, and then eaten by the girl's actual mother, or, if the latter be not alive, by a tribal mother. If it be a

FIG. 6
Tooth Knocking Out Ceremonies, Woman Drinking Water Previous to the
Extraction, Warramunga Tribe
Spencer & Gillen's "*Across Australia*," London, 1912, Vol. II, p. 385

TOOTH KNOCKING OUT CEREMONIES, FORCING THE GUM BACK, WARRAMUNGA TRIBE
FIG. 7
SPENCER & GILLEN'S "ACROSS AUSTRALIA," LONDON, 1912, VOL. II, P. 387

man's tooth its fate is still more curious. It is pounded up and must be eaten by his mother-in-law—which is perhaps the most extraordinary use for a mother-in-law that any Australian tribe has devised."

It is very difficult at the present time to ascertain if tooth mutilations were in vogue in Tasmania (Van Diemen's Land). The Tasmanians are extinct—the last survivor, called Truganina, died in 1876. Roth (28) visited the Tasmanians and remarks, "We observed some natives in whom one of the middle teeth of the upper jaw was wanting, and others in whom both were gone," and later (29) makes the same statement again, but adds, "we could not learn the object of this custom, but it is not general, for the greater part of the people had all their teeth." Henderson (30), however, describing these people, when visiting Tasmania in 1830, sixty years before Roth, says, "The extraction of one of the front teeth from all males is not practised in Van Diemen's Land. An examination of the skulls in the museum of the Royal College of Surgeons shows that in so far as the skulls there collected are concerned the Tasmanians were not in the habit of knocking out a front tooth."

Spencer (31) says they did not practise the knocking out of teeth.

POLYNESIA

Samoa

That statements made by some travellers cannot be accepted as based on facts may be proven by quoting Brown. When speaking about toothache among the natives of Samoa this observer says, "caries of the teeth is common (32) and they are much troubled with toothache," but later on page 177 continues

28. H. Ling Roth: *The Tasmanians*. London, 1890, page 23.

29. *Ibid.* Page 128.

30. John Henderson: *Observations on the Colonies of New South Wales and Van Dieman's Land*. Calcutta, 1832, Vol. II, page 148.

31. Herbert Spencer: *Principles of Sociology*. London, 1874, Vol I, Table V.

32. George Brown: *Melanesians and Polynesians*. London, 1910, pages 55-177-180.

in the following strain, "toothache was common but was not often caused by caries in the teeth," and then again, "in Samoa toothache is common and the teeth are often carious, and for this reason only young people are allowed to chew the 'ava.' "

That the older people did not attempt in any measure to alleviate their pains may be due to their conception that all diseases (33) are due to the wrath of some deity, particularly the household god who would punish them with baldness and the loss of teeth if they violated the rule of not touching the dead.

There seems to be no record of any teeth mutilations in Samoa. The natives of the Tonga (34) Islands extract or knock out some of their teeth, but only as a sign of the married state. Skulls from the Marquesa Islands show also two or three missing incisors.

That the natives of the Sandwich Islands (Hawaii) practise mutilation of the teeth has been known for a long time, and has been commented upon by various explorers, who have ascribed various and often conflicting reasons for these customs.

Cook (35) mentions the knocking out of from one to four of the front teeth, but says nothing about its origin or purpose, while Ellis (36) tells us that the Sandwich Islanders say that the bodily mutilations they undergo at the death of their chiefs, etc., are intended to show the loss they have sustained, and to perpetually remind them of their departed friends. Goldsmith (37), however, says that the knocking out of the four front teeth may with propriety be classed among their religious customs. Most of the common people and many of the chiefs have lost one or more, which seems to have been considered a sacrifice to the Eatooa, to avert his anger.

33. **George Turner:** *Nineteen Years in Polynesia*. London, 1861, page 145.

34. **H. von Ihering:** *Zeitschrift für Ethnologie*. Band XIV, page 255.

35. **Captain James Cook:** *Narrative of Second Voyage*. Page 69.

36. **W. Ellis:** *Polynesian Researches in the Society and Sandwich Islands*. New York, 1883, page 151.

37. **J. Goldsmith:** *A General Review of the Manners, Customs and Curiosities of Nations*. London, 1818, Vol. II, page 206.

The Hawaiian skull collection of Davis (38), consisting of more than a hundred crania, show many with missing superior and inferior incisors. Judging by the closed alveoli, it proves that they were extracted long before the death of the subject.

A skull from the Chatham Islands has been mentioned (39) in which four incisors are missing with the alveoli closed.

MELANESIA

Special attention is paid to teeth mutilation throughout Melanesia, often in conjunction with teeth discoloration. "It came from Sumatra (40) to the Moluccas and spread to Formosa and Borneo. Both sexes have their teeth filed but the superior anterior teeth are the ones mostly attended to. They do pointed filing carving of a "Quer-Rille" and knocking out of a triangular space between the two superior central incisors."^o

Tooth mutilation is not subject to any particular age but is usually started at puberty, although one finds men of advancing years who never have their teeth attended to. The general opinion prevails that one must do it before he marries. The origin seems to be the idea that long teeth are considered to be dogs teeth, hence the filing. It is, therefore, an intent to beautify the facial expression. The natives when asked point blank the reason, answered that teeth filed to a smaller size were more beautiful than the large healthy white elements.

According to Ribbe (41) the natives of all the Islands of the Solomon Group blacken their teeth, for which purpose burned wood is used. The blacker the teeth the more beautiful they are.

Powell (42) speaking about the surgery of the natives of this island, says: "I have also seen a man who had had put in

^o This author gives no proof of his contention and the statement cannot therefore be accepted as final.

38. J. B. Davis: *Thesaurus Craniorum*. London, 1867, page 325.

39. Herman von Ihering: *Zeitschrift für Ethnologie*. Berlin, 1882, Band XIV, page 257.

40. Friedrich Ratzel: *Volkerkunde*. Leipzig, 1888, Vol. II, page 395.

41. Carl Ribbe: *Zwei Jahre unter den Kannibalen der Solomon Inseln*. Dresden-Blasewitz, 1903, pages 240-266.

42. Wilfred Powell: *Wanderings in the Wild Country*. New Britain. London, 1883, p. 166.

new teeth made of pearl shell. This was accomplished in the following manner: the gums, in the place where the teeth were required, were cut open to the bone and a piece of pearl shell shaped at one end like a tooth was inserted. The device was held together by an arrangement of bamboo fibres; meanwhile the man was fed on soft food so as not to disturb the healing."

The natives of New Guinea blacken their teeth. This is done generally when the boys are about 12 years of age, though it makes their mouths sore and is not usually done until after puberty. It is practised by both sexes and occasionally by men and women past middle age. The usual reason assigned for blackening the teeth is that it is ornamental, and it is clear that it is done as a means of personal adornment and to attract the attention of the opposite sex.

Several authors inform us that filing is in vogue in New Guinea. Earl (43) says: "the natives have the custom of filing or grinding the front teeth to points. Wollaston (44) gives a little more detail and comments as follows: "The Papuans of Wakatimi have strong teeth, but not as white as some other black races. A good many men file or chip the upper incisors to a point, but this has not, so far as we know, any particular significance." Another traveller, (45) gives a lengthy but animated account of things observed in New Guinea. "A man with toothache will say that 'a spirit is eating my teeth.' The people seem to realize that there is something inside the teeth, what it is they do not know definitely. They recognize that it is in this 'something' that the pain arises; but I could not ascertain the connection between this 'something' and the spirit which is supposed to cause the trouble. If the aching tooth can be gotten at, they adopt a method of native explanation of which was translated to me as being drawing or driving out of the mysterious 'something, from the tooth. This is done in some way with an ordinary native comb, without extracting the tooth itself; but

43. G. W. Earl: *Voyages Through the Moluccan Archipelago and in New Guinea*, p. 5.

44. A. F. R. Wollaston: *Pygmies and Papuans in Dutch New Guinea*. New York, 1912, p. 111.

45. Robert W. Williamson: *The Mafulu Mountain People of British New Guinea*. London, 1912, p. 241.

how this is done I could not ascertain. There is no incantation connected with the operation. Another cure is the chewing of leaves of a certain tree (I do not know what tree)^f so that the sap of it gets into the hole of the tooth and thereby, as they think, draws or drives out this nerve, or whatever this 'something' may be. The Fathers of the Mission told me that both remedies were effective."

That the custom is not a general one may be shown by quoting Muller (46) who informs us that "the people of the village Uta, southern coast, and their tribal relatives, have good teeth, which in the majority of cases are filed to a triangular point. The inhabitants of Loto, a little more to the west, do not practise filing the teeth."

Filing according to Neuhauss (47), is not practised by the Papuans, but this author saw a man with two missing superior incisors, which upon inquiry were found to have been knocked out by a European as a "reward" for his refusal to obey the latter's orders. In the vicinity of the Gulf of Huron, black teeth are considered beautiful.

The filing of teeth was observed among several tribes in Southwest Dutch Guinea (48) but did not seem to be a common custom. They filed the labial surfaces of the incisors and although chewing betel, discoloration did not seem to be the aim of the chewing. Bevan (49) substantiates this statement saying "The Papuans near Port Moresby chew betel as it makes their stomachs feel comfortable. No attention is paid to the staining effect on the teeth." The members of this expedition when referring to the head hunting practice, say that this custom is not a remnant of cannibalism but is instead a motive of pride and self edification. A man who is able to show many skulls is looked upon with respect and awe by his fellow tribesmen.

^f Eucalyptus leaves?

46. Salomon Muller: *Land en Volkenkunde*. Leiden, 1839, page 44.

47. R. Neuhauss: *Deutsch Neu Guinea*. Berlin, 1911, Band I, page 195.

48. De Zuid West Nieuw Guinea Expeditie Kon: *Ned: Aardrykskundig Genootschap*. Leiden, 1908, page 547.

49. C. G. Rawling: *The Land of the New Guinea Pygmies*. London, 1913, pages 54-74.

Rawling (50) on his visit to the southern coast of this island met with the same customs and says "the custom of filing the front teeth to a point, often assumed by travellers to be a sign of cannibalism, is also general amongst the natives of the Mimika district." This observer believes that adornment is its purpose and must not be ascribed to enable them to tear human flesh with greater ease.

The custom is practised by the males only and are not filed but chipped piece by piece with pieces of flint and sharpened shells, used the same way as a chisel.

Earl (51) speaks of the coast tribes of New Guinea and of the island lying immediately to the east, who have the practise of filing their front teeth to points but does not mention any definite region or tribe.

I have read an author who was present at a cannibal feast where the body of a captured enemy was devoured; but the reference was lost, hence the authority cannot be given. This is stated to show that cannibalism exists in some parts of Guinea.

Knocking out of two incisors (52) is known to be done in the New Hebrides by "the married and engaged girls." It is done with a stick hit by a stone. The same is done by the women of St. Philips Bay, Marina Island. In a missionary visit in 1848 to New Caledonia Eckart relates that "at death they dress the body with a belt and shell armlets. Raise and cut off a finger and toenails whole to preserve as a relic. After ten days they twist off the head, extract the teeth as further relics, and preserve the skull also. The teeth of the old women are taken to the yam plantation as a charm for a good crop and their skulls are also erected there on poles for the same purpose."

MICRONESIA

The customs under consideration are known to be practised

50. **Theodore F. Bevan:** *Toil, Travel and Discovery in British New Guinea.* London, 1890, page 25.
51. **George Windsor Earl:** *The Native Races of the Indian Archipelago: Papuans.* London, 1853, page 5.
52. **M. Eckart:** *Der Archipel der New Hebriden.* Hamburg, 1877, page 421.

on several of the islands of this group. Gerland (53) speaks about the knocking out of some of the incisors occurring all over Micronesia, and Chamisso quoted by him informs us that the natives of "the Ratak Chain, Marshall Islands, also practise the custom. The latter also blacken their teeth with some sort of 'a nut' mixed with lime, the process taking five days."

"The chewing of betel is known to exist among the natives of Mariana, Palue (Pelew), Eap (Yap) and Ngoli."

Hernsheim (54) goes into detail about a custom on the island of Yap, where the young woman, upon reaching puberty, or the marriageable age, is not allowed to look upon a man for two or three months and so repairs to the woods. During this seclusion she blackens her teeth and when her time is over, is allowed to return to her village where she resumes her work as usual and waits to be courted.

Conclusion

It is speculative, with the evidence at our disposal, to trace the origination of the custom. The knocking out of teeth as found on the Ratak and Tonga Islands, the New Hebrides, Hawaiian and Marquesa Islands, and particularly in Australia, may upon analysis of the different facts, prove of great importance.

The writer believes that the custom originated in Indonesia or on the Asiatic mainland, basing his conclusion on the following facts:

First.—In the cases of the Tonga Islands, New Hebrides and Marina Island the reasons given for the knocking out of the elements, as the sign of the married state, may point to a common origin of these procedures.

Second.—The motive prompting the measures in the more eastern islands are at variance. None are associated with puberty or the married state, indicating possibly the loss of the original significance.

Third.—Westward we meet with the custom in Celebes as a

53. Gerland in Waitz *Anthropologie*. Band VI, page 403.

54. Franz Hernsheim: *Südsee errinerungen*, 1875-1880. Berlin, 1883.

TABULATED REVIEW

AUSTRALIA—OCEANIA

Tribe	Location	Mode of Procedure	Sex	Age	Remarks
Victorian	Victoria, Southeast Australia	Knocking out of tooth	Male	Puberty	Initiation ceremony and an allusion to a hope of immortality
Granji	Eastern coast New South Wales	Knock out one tooth	Both	?	Superstition connected with the falling of rain.
Arunta	Finke River, Northern So. Aust.	One sup. central incisor	Female	?	Is in some way connected with the falling of rain.
Chingili	Southern part, Northern Territory 200 miles north of the Arunta	One tooth	?	?	Is in some way connected with the falling of rain.
?	Cape York Peninsula, North Queensland	One tooth		uberty	To determine a man's totem or country he belongs to
Bidjaka	Queensland	One or two			
Kaitisch	Northern Territory, South Aust. North of the Chingili	One tooth		uberty	Was not a general practice.
Eastern Tribes	Eastern Australia	Knocking		14	Is the essential initiation ceremony Howitt claims that these tribes do not practice it.
Kamilaroi	Liverpool Plains, New South Wales	Knocking		14	Initiation ceremony. Forced extraction on other tribes to prove their inferiority.
Eualayi	?	Knocking		uberty	Part of the initiation
Dierrie	Lake Erie, South Australia	Knock on upper }		8-12	Part of initiation, combined with a superstition that
Warnanaga	Northern Territory of South Australia near the Chingili	One sup.		young 14	Tooth is pounded fine and eaten by mother or mother-in-law. Also connected with the falling of rain.
South Eastern Tribes	Southeastern Australia	Knocking		uberty	Initiation ceremony.

TABULATED REVIEW—(Continued)

AUSTRALIA—OCEANIA

	Mode of Procedure	Sex	Age	Remarks
Papuas, . . .	Knocking out	?	?	Secondary ceremony to circumcision and sub-incision.
Papuas . . .	One superior incisor	?	?	Was not a general practice.
?	Knock out incisors and blackening	?	?	Origin unknown.
?	Knock out from one to four incisors, both superior and inferior	Both	?	A voluntary sacrifice to remind them of their departed friends. A sacrifice to the Estoon to avert his anger. (Religious motive.)
?	Blackening	Female	Puberty	Remains to the woods for three months, blackens her teeth and returns waiting to be courted. To show she is of marriageable age.
New Guinea	Blackening	Male	Puberty	Adornment
Wakaitini, New Guinea	Pointed filing	?	?	No particular significance.
Uta, Southern New Guinea	Pointed filing	?	Both	
Chatham Islands	Four incisors are missing	?	?	Found present in a skull.
Tonga Islands	Knock out teeth	?	?	To prove their married state.
Marquesa Islands	Two or three incisors are missing	?	?	?
New Hebrides	Two incisors	Female	?	Is practiced by the married and engaged girls.
St. Philips Bay, Marina Island	Two incisors	Female	?	Is practiced by the married and engaged girls.

puberty rite not associated with other tooth mutilations. These procedures are also observed in the Mentawai Islands, Formosa and China, but for various reasons.

Fourth.—The presence of the custom in Australia is found primarily as a puberty rite, and has been reported from Tasmania. The Tasmanians may be looked upon as the pure Australian from the mainland, not influenced by subsequent invasions to which the latter may have been exposed. This may prove that the custom is of great antiquity and was in use by the original Australians, and not a product of the later invasions. (Whether the custom is a product of Australian life or adopted from outside cannot be established at present.)

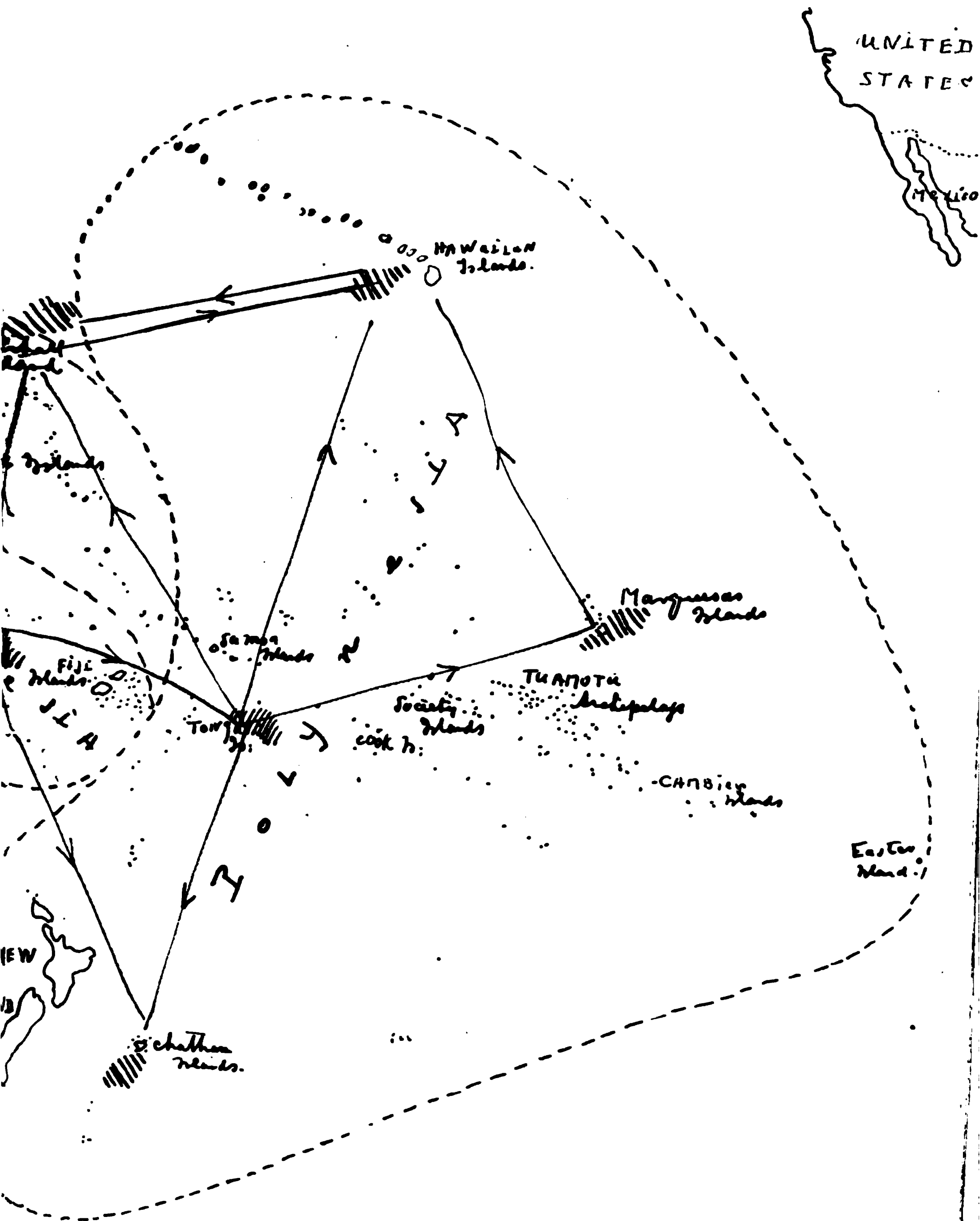
Fifth.—In Africa twenty-one tribes—principally in Northeastern and central Africa—practice these customs, not associated with other tooth mutilations. The fact that tooth knocking out customs are reported on the Pacific coast of Mexico and South America but not on the Atlantic coast may also support the theory of an Asiatic or Indonesian origin.

Summary

The knocking out of teeth in Australia has been given different motives among the various tribes but also among the same tribe by various observers. It may be said, however, that the practice is an essential part of the initiation ceremonies, but the fact that three tribes connect it with the falling of rain, without reference to age, makes it difficult to come to a tenable conclusion as to its original significance. To this may be added that other tribes consider it as a sign of immortality, a token of a man's totem or to show an inferiority of race by knocking out the teeth of the conquered tribe. This makes the situation still more complex.

The writer believes, however, that the rite was originally a part of the initiation. He bases his conclusion on the following evidences at hand.

First.—We find seven cases in which it forms a part of these ceremonies.



of distribution of the procedures described.

Second.—In cases where we know it to be the initiation rite it is invariably practised on the male at puberty.

Third.—When we find it connected with rain it is practised among the females of one and both males and females in another tribe, so that there is no consistent link.

Fourth.—Among the various motives given in the cases not associated with initiation, or rain, one finds various explanations presenting no consistent theories; the motives in these cases may therefore be considered as secondary to the primary motive, the latter having lost its original significance in space and time.

The accompanying chart is submitted to illustrate the conclusion arrived at.

The reasons for the customs in Celebes, New Hebrides and the Tonga Islands are associated ones, which prompts the drawing of a line of emigration as shown. How these customs reached the Marshall and Chatham Islands is an open question—hence the construction of imaginary, but probable lines of communication. The same may be said of the Hawaiian and Marquesa groups.

NOTES ON ORAL SURGERY¹

BY THEODOR BLUM, D.D.S., M.D.

IN considering the progress which has been made in this country during approximately the last five years in the technic of oral surgical operations, one wonders what has been the cause of such rapid advance. It is true that a better knowledge of the pathology of the mouth, especially gained by the study of the works of men of the European continent, has influenced the surgical technic to a considerable degree; still we must admit that the clinical observation of cases before, at and after the operation is of equal importance. Was this possible when operating under general anesthesia? Of course not, mainly because the lack of time and coöperation of the patient, the bloody field, etc., prevented a clear view and close study. So here again I have to emphasize the extreme value of conductive anesthesia. It alone permits one carefully to work out the minute technic of the intra-oral operation.

A lack of standardization is noticed when studying the different authors in going over the various injections of conductive anesthesia. I will not go into detail as to the causes; although I may say that it is due mainly to the neglect of the study of applied anatomy. The so-called Fischer's method of injecting into the pterygo-mandibular space is one example. One must remember that the bony points alone are an absolute and sure guide for the needle, and that, therefore, the striking of the internal oblique line, the passing of the same and the sliding along the inner aspect of the ascending ramus are absolutely essential. When following out this principle, the syringe will practically never cross the median line and surely never rest on the cuspid or bicuspid of the opposite side. To my knowledge, a needle has never been broken when using this method, while during the last year I had at least six cases of broken needles

¹ Read before the meeting of the Waterbury Dental Society, November 26, 1918.

FIG. 1

FIG. 2

FIG. 3

FIG. 4

under my observation, the X-ray examinations of which showed that Fischer's method had been employed and also the so-called Safety Disc Needle, a thin steel needle, which should never be used for mandibular injections. The remarkable thing is that while the Safety Disc is supposed to remain with the distal part of the needle, it has in all my cases remained with the central part (Figs. 1, 2).

It is also claimed that a tuberosity injection will anesthetize not only the three molars, but also the two bicuspid. To this I may say that it is anatomically—I have seen it also clinically—impossible to get such an anesthesia with a pure conductive tuberosity injection.

The method of extracting teeth was much improved through the employment of conductive anesthesia. The hard and soft tissues are seldom lacerated, and the teeth themselves completely removed. The patient, as after all other operations, must receive instructions regarding pain, cleanliness and swelling, and must return the next day for inspection of the wound. We must always be guided by the principle that everything abnormal should either be removed or corrected. This holds good for unerupted teeth also.

A male patient, age 33, gave a history of having had a swelling in the region of the lower right and left bicuspid for the last 15 years without experiencing any pain and paying no attention to it at all. Suddenly, without any acute inflammation, severe pain set in, caused by the distention of a large cyst by a sudden increase of the cyst fluid which, upon incision, contained an enormous number of cholesterin crystals. The cyst was of the follicular variety, originating from an unerupted lower right cuspid tooth (Figs. 3, 4, 5).

The physician as well as the dentist often encourages the patient, who, as well as they, believes that as long as no discomfort is experienced such a condition may just as well be left alone. Here it may be said that it is a distinct advantage to operate while the diseased parts are quiescent. The same should be remembered in relation with radicular cysts, impacted teeth, etc.

Of the impacted teeth, the last molars are by far the most

frequent. To make myself clear as to what I mean by impacted, I wish to say that an unerupted tooth may be impacted, but an impacted tooth need not be unerupted; impacted meaning wedged and leaning against another tooth. An unerupted and also impacted tooth may again be partly developed. According to the age of the patient, a tooth may be late in erupting or remain entirely unerupted. These cases need careful physical and X-ray examination to determine the surgical procedure.

A young girl, age 16, showed upon X-ray examination two lower impacted, unerupted and partly developed third molars (Fig. 6, 7). Although there were no symptoms, I advised the early removal of the two teeth because by waiting, the bone would become more dense and the roots themselves fully developed, increasing, without any doubt, the difficulty of the operation.

Another case, a girl of 15, showed two partly developed and unerupted lower third molars. Because of her age, removal would have been contra-indicated had it not been for continuous and severe neuralgic symptoms in the right mandible (duration 1½ years) which ceased after its removal (Fig. 8). The left molar was allowed to remain undisturbed (Fig. 9).

Of all patients coming under our care, a history must be obtained. If they are suffering from a systemic malady, a complete medical history is of the utmost importance.

A patient, male, 40 years of age, came to my office with a set of X-rays of his teeth asking for the removal of abscessed teeth. He believed in homeopathy only, and I had great trouble in getting the following history from his physician:

"The patient has been under my care since October, 1915. He has had otitis media suppurativa chronica in that year. Last May he was nervously run down, tense and irritable, with lameness in the joints of the legs. There was also alopecia areata. He was depressed and had eczema marginatum at the base of the scrotum and adjacent thighs. In June the eczema extended in area, with much itching, and extreme depression.

"In September he reported with glandular developments at the base of the neck, the groin and axilla, and considerable increase in the area of the eczematous eruption on arms and legs. He was weak, had a waxy look, hemoglobin 85 per cent, white

Fig. 5

FIG. 6

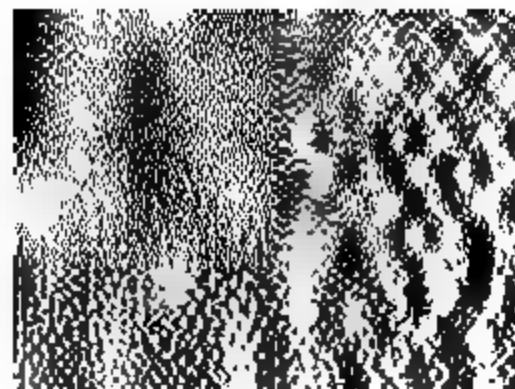


FIG. 7

FIG. 8



count 11222, with polys $62\frac{1}{2}$ per cent, lymphocytes $34\frac{1}{2}$ per cent. Both eruption and glands increased during the next three weeks, and it looked like a beginning pseudo-leukemia. Radiographic examination of the teeth, however, showed several large pus pockets, and it seemed likely that there was a systemic infection from that focus, and the lame joints, eruption, and glandular enlargements, might be secondary to that. The removal of the infected teeth is, therefore, advised in the hope that the condition will clear up. His heart and kidneys are normal, and the operation would seem quite safe."

From another physician the patient went to, I received information that he had a one plus Wasserman about two months ago. The entire picture which I had made in my mind of his general condition was at once changed and with it, of course, the prognosis.

I may mention here that it is impossible, to my knowledge, to make a diagnosis of an abscess at the apex of a tooth from an X-ray alone. If the area of absorption at the end of a tooth is small, we must call it a chronic apical pericementitis showing a chronic thickening of the apical pericementum. In fact, the large majority of rarefied areas do not contain pus although they do, as a rule, upon culture, show some microorganism.

To patients, with some systemic disease, who consult me about their teeth, I usually say the following: "You are suffering from an obscure trouble the cause of which we are trying to find. Your whole body has been examined and nothing abnormal has been detected; your mouth shows pathological conditions; they may be the cause of your ailment; therefore, I must advise you either to have them cured by dental means or removed by surgical procedure. Should your general condition improve and become normal after such treatment we would have good reason to believe that they were the cause, but even the persistence of the symptoms would not prove that they were not the cause, as the prolonged presence of such foci may have damaged the body tissues irreparably and permanently."

In considering infections of the soft tissues, ulcerative stomatitis in its mild variety is probably the most frequent seen in our specialty. It is often improperly called Vincent's Angina

by those men who do not want to remember that the term Angina (*angere*, to strangle) according to Gould's Medical Dictionary, means: "Any disease attended by a sense of choking or suffocation, particularly an affection of the fauces or pharynx presenting such symptoms." It should, therefore, be called Vincent's Stomatitis if the so-called Vincent's organism, namely, the *Bacillus Fusiformis* and *Spirochete Vincenti* are found. The treatment consists of proper scaling, the application of 8 per cent zinc chloride or tincture of iodine upon the dried ulcerated surfaces, the use of a mouth wash (preferably peroxide $\frac{1}{3}$ to $\frac{2}{3}$ water followed by boric acid solution every hour or oftener if necessary), the application of iodine petrogen 10 per cent to the gums three times a day, fluid diet and a thorough purge. Ulcerative stomatitis may be caused by a partly erupted wisdom tooth, the gum pocket of which has become irritated and infected.

A young male, 17 years of age, came to my office for the extraction of a lower right partly erupted third molar. He was suffering with extreme pains and gave a history of having had tonsillitis a few days before. Ulcerations were seen on the gum tissue covering the last molar and the gingival pyramids of the adjoining teeth, and also other parts of the mouth were ulcerated and bled easily. The third molar being in normal position, I decided to save it. We started the above treatment and succeeded in uncovering the occlusal and part of the posterior surfaces of the last molar by also packing iodoform gauze between the tooth and the gum tissue. I believe that the infection started from the gum flap covering the posterior part of the last molar and then extended posteriorly to the fauces and anteriorly over a large part of the oral cavity.

The infections of the bone proper must be treated conservatively, namely, by evacuating the pus and allowing the sequestra to separate completely, if possible, before removing them during which time thorough drainage must be kept up (Figs. 10, 11, 12). The advantage lies in the prevention of pathological fracture in severe cases, the sequestrum acting as a splint, as well as the prevention of the extension of infection into the sound and healthy bone by an early attempt to remove a partly separated sequestrum.

FIG. 9

FIG. 10
Chronic osteomyelitis of left mandible (radiographed August 20, 1917) of a girl age
12. History of dental treatment of left lower first molar in May.

FIG. 11
Same as Fig. 10 (radiographed October 2, 1917). Condylod Process sequestrated
lying in front of the angle of the left mandible.

FIG. 12
Same as Figs. 10 and 11 (radiographed November, 1918), showing regeneration
of mandible

FIG. 13

Copper wire fastened around upper and lower bicuspid, the loops of which are connected with ligature wires. Note the two parallel lines of fracture running anterior and posterior to the cuspid tooth embracing the mental foramen (left mandible).

FIG. 14
Right mandible of same patient as Fig. 13. Bicuspid used for the same purpose as of the left side; line of fracture through angle.

The following history given by a patient's dentist may be of interest:

"About four months ago I was called in by the patient's medical doctor and found her shortly after child birth suffering from a superficial abscess of the left cheek, involving the whole cheek, filled with pus, pointing externally, of quite a few days duration.

"Examining the mouth I found a broken down lower left first molar, which I extracted immediately under chloroform.

"Patient's physician opened the abscess externally also relieving much pus and has continued dressing same off and on since, I am told. She is now being attended by a surgeon who has advised the removal of the second and third lower molars, with a drain left in. Patient is of a nervous type, about 19 years of age."

The surgeon attending the case asked for the removal of the last two molars to establish drainage of an abscess which was entirely superficial and circumscribed, and which, as the operation showed, was removed readily, leaving an absolute smooth granulating surface without any connection with the mandible whatsoever. I may emphasize here that one must not follow the outline of treatment no matter who makes the suggestion, unless it coincides with one's own findings and conclusions.

When dealing with fractures many different methods of splinting have been recommended (maxillo-mandibular, interdental, sliding joint, wires); the most perfect method at the present time consisting of the use, if possible, of No. 23 copper wire. The wire is so manipulated as to form a loop which is placed in the space between the necks of two adjoining teeth buccally, while the two ends of the wires are each placed around the necks, joining anteriorly, and being tightened so that the loop is nearer the gingiva. Placing such loops at indicated points, those of the two jaws are united and firmly pulled together by orthodontic ligature wire. I watched a demonstration of this method which was given several years ago by Lieut. Graham at the State Dental Meeting at Burlington, Vt. (Figs. 13, 14).

In regard to tumors of the mouth, one must not forget that their pathology is different in many respects from that of other

parts of the body. At any rate, radical surgical procedure is always indicated. The taking of a specimen from a tumor for a microscopic examination, is absolutely contra-indicated for fear of tumor cells being carried by the blood or lymph stream into other parts of the body (Bloodgood). Often syphilis is associated with carcinomas or may resemble a neoplasm clinically. Therefore, a Wasserman test should always be made before operation.

A patient, 55 years of age, was referred to the clinic on account of an apparent pyorrheal condition. His dentist had treated him for a few months for pyorrhea. The examination showed a cauliflower growth involving the left fauces and extending forward to the molar region (Figs. 15 and 16). The growth apparently was reduced in size by potassium iodide prescribed for the patient in the Nose and Throat Department. The specimen removed at the time of the operation was diagnosed as carcinoma.

S. S., male, age 27, came to the hospital September 26, 1918. During the end of July, 1918, patient removed a loose left lower first molar with his fingers; the next morning his face was swollen (?). The patient did not pay any attention to the swelling of his jaw and face until he went to see a dentist about August 1st, who took X-rays making a diagnosis of osteomyelitis (Figs. 17, 18), and advised removal of all teeth of the left mandible. The wound was treated two weeks without any favorable results.

Examination of the patient showed a marked soft swelling in the region of the left mandible (Fig. 19); skin was normal and movable; sub-maxillary lymph glands palpable and movable; no acute symptoms; no sensitiveness to touch. The examination of the mouth revealed a large soft swelling involving the left mandible and the adjacent tissues of the cheek and floor of the mouth, covered by a smooth and normal mucous membrane except for a wound in the region of the sockets of the three molars, out of which grew a small tumor mass resembling slightly granulations which were not vascular and did not bleed easily (Fig. 20). Manipulations of the mandible showed the presence of a fracture which by means of the X-ray was diagnosed as a patho-

FIG. 16

FIG. 17
Sarcoma of left mandible.

FIG. 18
Symphysis of same case as Fig. 17.

FIG. 19

FIG. 20

FIG. 21
Left mandible, same as Fig. 17 (radiographed October 1, 1918), showing ascending ramus and pathological fracture in region of first molar.



FIG. 22
Same as 21, showing mandible up to symphysis.

FIG. 23
Right mandible of preceding two figures showing tumor extending well into this side.

logical one (Fig. 21, 22, 23). Diagnosis: central (medullary) sarcoma.

I have seen many cases where dentists have treated loose teeth or swellings in the mouth for many weeks considering the cases to be pyorrhea, osteomyelitis or what not, while a diagnosis of malignancy could be made offhand. It is of the utmost importance for the dentist to see these neoplasms and recognize them as early as possible, as the success of an operation depends on early surgical interference.

In conclusion, I may say that my experiences in my few years of practice have been rather disappointing regarding many oral surgical cases which came under my observation after having been treated by either a physician or a dentist. The physician, of course, is not prepared to take care of the diseases of the oral cavity on account of the lack of instruction in this subject during his medical course, except in a general way to relieve pain, or in an acute condition. The dentist, on the other hand, is better prepared, special attention being paid, during his dental studies, to the work dealt with above. He again needs a broader medical view and knowledge if he intends to specialize in oral surgery. Therefore, the only way I can see to make up for his neglected medical education is the continuous study and association with a hospital through which he will be placed, in due time, in a position to practice that part of surgery of the mouth which comes within his field. All this is not said to discourage the dental practitioner from treating these cases, but rather to arouse his ambitions and to stimulate him to more serious and intense study.

140 West 57th Street, New York City.

THE QUESTION OF SO-CALLED "DEAD TEETH" WHEN VIEWED FROM THE STANDPOINT OF THE PATIENT'S HEALTH¹

BY ELMER S. BEST, D.D.S.

THE dental profession as a whole must soon decide what it intends to do with the question of the so-called "dead tooth." It is not sufficient for us to say that it is the most important subject in dentistry and let it go at that. It is something more. It is the subject on which those who practice medicine and dentistry will be closely united or it will constitute a barrier separating the two professions. If it develops into the latter, it inevitably means a serious division in our own ranks and will result in untold suffering for humanity. You are quite aware of the various views on the subject and you know how they differ. You also know how difficult it is to reconcile the two popular opinions on the subject. These two opinions, however, are not held exclusively, one by the medical and one by the dental profession. Each is more or less divided in their opinion when it comes to the extraction of non-vital teeth. No physician living could possibly be more radical in sacrificing human teeth than are some dentists, many times entirely regardless of the consequences to the patient. There are many just reasons supporting both views and assuming that neither one is entirely correct; there must be some incorrect theories. To aid us in arriving at a correct conclusion, let us recognize two principles:

First, infected pulpless teeth have a deleterious effect upon the human system; this is accepted as settled.

Second, the removal of a large number of teeth, good, bad and otherwise, may and may not cause the symptoms to disappear, and, as an operation, has but slight grounds for justification.

When we all agree on the first principle as we should, the second is not so difficult to correct and make acceptable. We

¹ Read before The First District Dental Society, S. N. Y., Dec. 2, 1918.
See disc., p. 465.

first of all must be willing to give the patient a clean bill of health as far as their teeth and investing tissues are concerned. At the same time, we must exercise our prerogative so far as our authority on dental subjects is concerned and not allow an unwarranted wrecking of the mouth. The advantage of team work both with physicians and dentists who limit their work to a definite specialty in this respect is quite apparent.

Working from the standpoint of the patient's health, we must first of all have a thorough oral examination. This is quite obviously the duty of the dentist specially trained in this work as it involves much more than the simple use of the X-ray. The diagnosis of the conditions found is only possible by the combined knowledge of the physician and dentist. No unnecessary teeth must be removed and yet no diseased conditions must be left. If a pulpless tooth and its supporting alveolus cannot be rid of pathological conditions in any other way, it must be extracted. Your essayist is prepared to stand or fall on this statement. It is the unquestioned right of the patient to demand that our work is reasonably free from resulting pathology, also, that we do not unnecessarily mutilate their mouths and a consideration of their interests come first, before those of the physician and before ours. When we have the second part of this question disposed of, which, as I have mentioned, is only possible with the coöperation of the physician, we proceed to the third and all important step, and that is, in those cases where teeth have been removed, we have the problem of the reconstruction of the mouth. Never in the history of dentistry have patients as much reason to be truly grateful for the ingenious, skillful, truly wonderful dental operators as they have when it comes to handling this problem. But the tragedy of it is, that there are not enough of these operators to serve all who are deserving of their services. It is with profound hope in our ability to standardize operations of merit that we look forward to placing these services in the reach of a larger number. The fee problem is today preventing thousands from having the type of service they require and the solution of that problem is going to come, simply because it must. And when it does, it will be because the men who work it out believed with Holmes when he said: "If your name is to live

at all, it is so much more to have it live in people's hearts than only in their brains."

My work then for this evening, instead of simply telling you a method of filling root canals, will be to explain to you what I conceive to be a complete and standardized oral examination. It should always constitute the initial step in establishing the foundation for a healthy and efficient masticatory apparatus. Then we will discuss the root canal problem.

A system of oral examination and diagnosis applied in its fullest sense by the general practitioner is admittedly something new in dentistry. To spend a couple of hours in making an exhaustive examination, coming to a fairly definite conclusion and conveying that conclusion to the patient and all the time dealing in plain facts as it is possible to see them, will be to those unaccustomed to such a procedure a matter more or less revolutionary. To establish such a procedure as routine practice may appear unnecessary to some and impracticable to others.

Notwithstanding, it is generally recognized by dentists that the time has arrived when they must display their qualifications as guardians of the health of their patients or lose caste.

Dentistry from the health standpoint, as generally practiced ten or even five years ago, is no longer adequate for the needs of the day. No longer is it a matter of option with the dentist whether he will be both careful and progressive or merely careful, according the standards set up years ago. Patients are rapidly becoming acquainted with the detail of their cases and will demand, as they have a right to, that they receive proper attention. The question of the bad results following dental operations has been very widely discussed, and the knowledge possessed by the average patient today is much superior to that possessed a few years ago. Hence, it may not be unreasonable to assume that a complete system of oral examination will be established by every dentist as routine procedure.

The great need of some means of correcting the errors that are daily being made is quite apparent and this paper is presented in the hope that in the future such an agency will be employed. In the past we know it has been lacking except in the hands of a few men who constitute a very small minority in the profession.

One has but quietly to observe the attitude of physicians and the laity to become aware of the feeling of skepticism with which they view many dental operations; though in many respects we were comparatively blameless, for until the general use of the X-ray, we had no means of determining the nature of periapical tissues. But how different it is now. If mistakes in diagnosis similar to those made in the past are continued in the future, the situation will be intolerable. As a result, there is only one course to pursue. Before assuming any obligation in placing restorative work of an extensive nature in the mouth, it is most obviously our duty to protect our patient and ourselves by insisting on the most thorough examination it is possible to make. We are most emphatically not justified in putting a patient to the expense of an operation unless we know as accurately as possible that the tooth or teeth upon which we are operating are free from periapical disease and that a consideration of the patient's health may not soon require their removal.

The examination system here outlined is something that fills a long felt want. In its present stage it answers most of the demands that could be placed upon it.

We know that it is of course quite impossible to look over a mouth and retain all of the visible details in one's mind. As we find conditions of interest and importance, they should be noted at once as a matter of permanent record. Also, decisions should only be made after the most careful deliberation and after all the evidence that can be secured has been reviewed. When they are made they should be recorded. We must, however, be able to see through to the ultimate end before accepting conclusions as final.

When any problem is too large to be completely understood, it should be handled in parts and each part thoroughly mastered. Then the whole problem becomes comparatively easy. We have mastered it.

Therefore, we divide our examination record into two parts:

Part 1. That portion of our work that has to do with ridding the mouth of infection and preparing tissues for the reception of our restorative work. This includes the following, and in the order named:

A. Thorough pyorrhea operations on teeth to be retained. (Fig. No. 1.)

B. Removal of decay and placing of temporary fillings in teeth adjacent to those to be extracted. (2.)

C. Placing of permanent restorations, fillings and crowns on teeth in no way involved in bridgework to be later inserted. (3.)

D. Removal of all unsanitary crowns and bridges. (4.)

E. Careful and thorough removal of all infected and unduly loose teeth, followed by necessary curetment. (Figs. 5, 6, 7, 8.)

F. Any root canal work that may be indicated. (9.)

The mouth having been freed from decay and pyorrhea conditions, the extractions and root canal operations have been made in a cleaner field.

Part 2. Includes all mechanical restorations such as crowns, inlays, permanent fillings, bridges, stationary and movable. Removable clasp cases, etc. (10.)

The examination complete consists of the following:

1. A standardized radiographic examination carefully mounted for study purposes, in a special mount. (11.)

2. An electrical test of every tooth to determine the vitality of the various pulps. Battery. (13.)

3. A very careful examination of each tooth as to its solidity in its socket, the condition of contiguous soft tissues, presence of pyorrhea pockets, calculus, etc., condition of fillings, crowns, bridges and the presence and extent of decay, contact points, abnormal color, etc. (12.)

4. Carefully taken impressions from which study models are made. (14.)

When a conclusion has been arrived at, we should sit down with the patient in our private office and explain to him, using the models for the purpose, the various conditions we have found that require correcting. Pyorrhea operations, extractions, pulp canal operations, fillings, etc., should be gone over with the patient. Explain carefully that you are only at this time considering Class A or Part One work. Explain that the restorative work will be taken up when your foundation has been established. We cannot tell them what our permanent operation will be until we are sure of our understructure. It will here be seen that

No. 1.

A set of study models of a mouth in which a great deal of pyorrhea is present.

No. 2.

The second bicuspid will be extracted on account of the alveolar absorption. The first bicuspid having a cavity in the occlusal will have a temporary filling until the case is ready for the construction of the bridge.

No. 3.

The central has been fractured and the pulp exposed. After the root canal operation, the permanent filling will be inserted as such an operation is entirely independent of any other operation.

No. 4.

The bridge replacing the first molar, which is of a fixed type, has a large saddle resting on the soft tissues. The lateral cuspid and first bicuspid are carried entirely by the cuspid. Such bridgework of course must be removed.

No. 5.

The upper right second and first molar, second bicuspid and central, and left first bicuspid, lower right second molar, first and second bicuspid, and left third molar will be extracted. Lower left first bicuspid has a well filled root. Upper left second molar will be retained and the root canals cleaned and filled.

Nos. 6, 7 and 8.
Show case No. 6 before and after the extraction of hopelessly involved teeth.

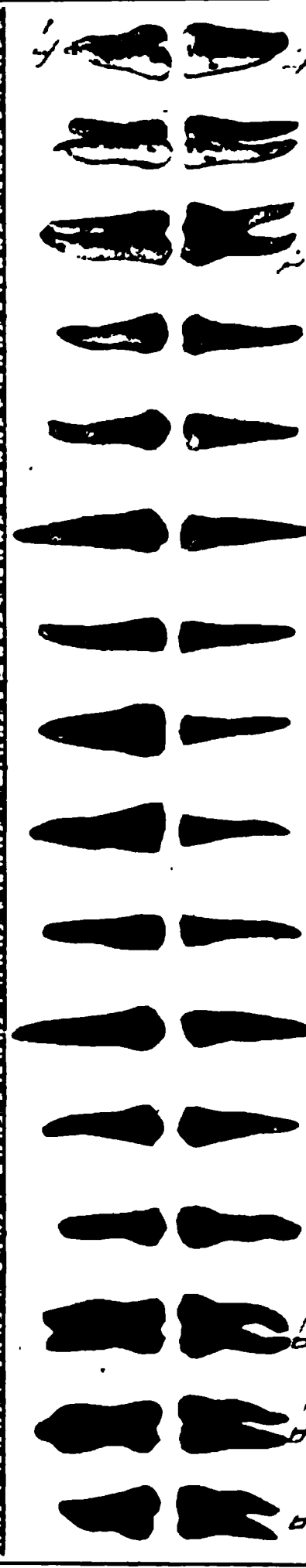
No. 9.
In the case of the cuspid the root canal must be thoroughly opened and cleansed and filled. This is a case where pulp canal work is distinctly indicated.

No. 10.
Model of upper case where extractions have been made and the case prepared for reconstruction.

Mr. J. E. Wilson, EXAMINATION CHART DIVISION A B C D E F G H I CASE NO. 6070 GENL COND 191

EXAMINATION A. B. C. D.

TOOTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Upper																																
Lower																																



No. 12.
Chart showing various conditions in connection with each tooth, which we wish to record.

No. 13.
Battery for testing vitality of each of the teeth.

No. 14.
Study models.

No. 15.
Examination Chart.

our first work has nothing whatever to do with restorative dentistry except in isolated cases where permanent fillings or crowns are placed in or on vital teeth which are in no way involved in any bridgework.

EXAMINATION CHART

The examination chart, which is $12 \times 8\frac{1}{2}$ ", of such size that it can be filed in a standard filing cabinet. It consists of six pages, each of which is for a separate and definite purpose. (15.)

Page one (16). At the top of the page is placed the patient's name, case number and date. A cut showing the thirty-two teeth is in the center of the page. Opposite each tooth is a space in which we place general information concerning the type of fillings, crowns, etc., placed in, on or around each tooth. Such knowledge is of great value in deciding on our reconstruction. In indicating pyorrhea conditions, we use 1 as a basis of normal. Hence, pyorrhea 1 means no pyorrhea present. A check over 2 means a slight amount of pyorrhea present, over 3 more pyorrhea, over 4 a very extensive condition, and lastly, if over 5, it means as extensive a pyorrhea condition as possible.

Page two (17). How frequently we wish to refer to a certain tooth and ascertain all that has been done with that particular tooth. In case details in the patient's case record are arranged according to date it may mean a long search before we finally locate the item we are looking for. However, with the arrangement as seen on page two, in the small rectangular spaces, we post the operation on each tooth at each appointment. This information is gained from the operative slip which is sent with the patient from the operating room and given to the assistant who makes the next appointment.

Operative Slip (18). Which is sent to the office with the patient, contains the patient's name, the operation just performed, with whom the next appointment is to be made and length of time to save; also, the fee for the operation performed, probable operation for the next appointment and any information for the case history.

Page three (19). This page is probably the most important of the entire chart and great care must be taken in filling it in.

First, we record the solidity of the teeth in their sockets indicated by "alv." abbreviation for alveolus. Its departure from a normal degree of solidity is indicated by 2 3, 4 and 5. 1, normal; 2, first degree of looseness; 3, second degree of looseness; 4, very loose, and 5, is loose as possible and yet be in position. The importance of this record can easily be appreciated in studying the casts of the case.

Second, we record the condition of the soft tissues, particularly in their relation to pyorrhea alveolaris. Depth and extent of pockets are indicated by 1, 2, 3, 4 and 5.

Third, the vitality of each tooth is carefully recorded. If vital, it is marked +, if non-vital, it is marked —.

Fourth, the quality of any root canal operation is made note of and recorded.

Fifth, the condition of periapical tissue as seen in the ray is noted.

Sixth, the extent of any decay but not its location is recorded. We list at this time the probable fillings to be used.

Seventh, the fillings present in the mouth are carefully examined and their quality is recorded.

Eighth, any crowns are examined and their condition noted. Particular attention is paid to the contour of the crown, the relation of the crown to the surrounding soft tissues and its fit.

Ninth, the condition of the contact point is recorded.

Tenth, a tooth of abnormal color such as we have in some instances following loss of the pulp is recorded as to its degree of abnormality in color.

Page four (20). This page represents the financial side of the work and is so arranged that all information desired is available. It is divided into two main parts—"Operations Planned" and "Operations Which Have Been Changed." Under the heading "Operations Planned" we have a line for each tooth where we enter the operations which we have planned for that tooth. In the second column marked, "C.B." we indicate all teeth that are involved in any bridge operations, then we have a column for the fees decided upon for the various operations, another in which we place a star for each operation definitely decided upon, and another column for the doctor who performs the operation. This

OPERATIONS PLANNED					OPERATIONS WHICH HAVE BEEN CHANGED				
Upper Right	C-B	Fee	Done	Finished	Upper Right	Fee	Done	Finished	
8				8					
7				7					
6				6					
5				5					
4				4					
3				3					
2				2					
1				1					
Upper Left					Upper Left				
1				1					
2				2					
3				3					
4				4					
5				5					
6				6					
7				7					
8				8					
Lower Right					Lower Right				
8				8					
7				7					
6				6					
5				5					
4				4					
3				3					
2				2					
1				1					
Lower Left					Lower Left				
1				1					
2				2					
3				3					
4				4					
5				5					
6				6					
7				7					
8				8					
Examination									
Pyorrhea or Prophylaxis									
Prosthetic									
TOTAL									
To be regular Pa. patient at \$					every				
Financial Arrangement by Dr.					months				
Exam.	Py. & Ps.	R. C. O.	Cur. Res.	Extract	Gold Inlays				
Gold foil	Porc. Inlays	Synthetic	Cement	Amalgam	Crowns				
Dentures	Fix. Br. Wk.	Rem. Br. Wk.	Orthodontia	Child. Dent.					

CASE RECORD			
Date	Reported by Dr.		Change of Condition

Age	Weight	Referred by
Physician		Dentist
History:—		
Findings:—		
Diagnosis & Treatment:—		
Prognosis:—		

CASE RECORD

[illegible]

No. 24.
Placing of electrode in cavity of vital tooth. Something to be avoided

applies to offices where doctors operate on a unit plan. Then there is a column marked, "Finished." After an operation is completed, it is marked "Finished" with a rubber stamp, which also includes the initial of the doctor doing that particular operation.

In case an operation is changed for any reason whatever, instead of stamping it "Finished," a stamp, "Operation Changed" is used. In a case of this kind, we enter on the same line under heading "Operations Which Have Been Changed," the new operation and followed by the new fee, etc. When an operation has been changed, a slip is sent to the bookkeeper in order that the record in the ledger record may be kept straight, as all information of a financial nature is transferred from the charge to the ledger page (21). In the lower left hand corner we enter an examination fee, also fee for pyorrhea or prophylaxis and the fee for the prosthetic work, when it is decided upon.

Page five (22). Here we enter the patient's age, weight, by whom they were referred, and the history of their case. This includes answers to questions concerning rheumatism, neuritis, headaches, stomach, eye, ear and kidney troubles, etc., also, where possible, a copy of the physician's report.

Findings. Here we report the general condition of the mouth and a general outline of the X-ray findings.

Diagnosis and Treatment. A general explanation of conditions and line of procedure in handling the case.

Prognosis. Consists of a general prediction as to the outcome of the case.

Page six (23). Is for the purpose of recording the progress and ultimate outcome of the case.

VITALITY TEST

Testing the vitality of the teeth is not a simple procedure or one that can be considered lightly. Our battery must be of such a nature that we can increase or decrease the amount of current applied. Some teeth such as the molars and cuspids may require a much greater current than centrals or laterals or bicuspid. Great care must be taken to not touch a metal filling or crown

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No. 27.
Testing lingual pit

No. 28.
Testing bicuspid on buccal surface.

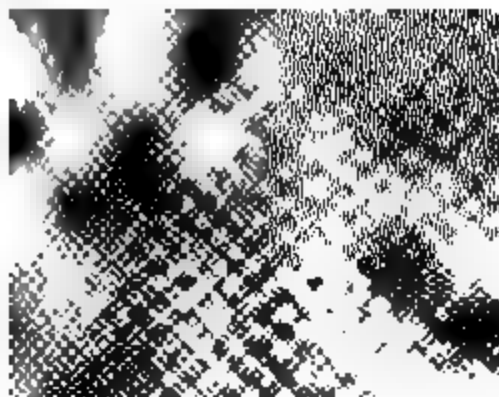
No. 29.
Testing bicuspid on occlusal surface.

No. 30.
Testing molar on buccal surface.

No. 31.
Testing upper centrals on incisal edge.

No. 32.
Testing molar on occlusal surface.

No. 33.
Testing lower central incision.



No. 34.
It is impossible to tell by the X-ray whether the second bicuspid is vital or not. Compare X-ray findings of the second bicuspid with that of the first bicuspid and first molar.

No. 35.
The upper and lower jaws are divided into definite areas. This arrangement becomes standardized and all cases are taken in the same way.

STANDARDIZED RADIOGRAPHIC EXAMINATION (35)

The system advocated for radiographic study has been completed after years of experimentation. Though probably not perfect yet, it will be found of great value in studying cases. The principle of standardization has, as can be seen at a glance, been the governing factor. As the number of cases increase and the time to be given to each case decreases, the need of standardization becomes imperative in order to avoid mistakes. It is so much simpler to study cases if all sets of films are alike, taken in the same position, same angle, same density, in fact everything the same each time. In case a person should be in a room with twenty-five or thirty people, each sitting in the same place day after day, each person dressed the same on every occasion, how quickly will we notice one absent; one too many present or one who one day wears a hat or goes without his coat.

In the same manner we, by making an exhaustive study of many normal cases, can almost instantly detect any pathological or abnormal condition as shown by the X-ray.

The arrangement of films is as follows:

1. Starting from the right side we have a film from the upper third molar to the central inclusive. This film gives us a wonderful outline of the lingual roots of the molars but not the buccal roots.
2. A film of the molars, giving a clear cut outline of the buccal roots of the molars.
3. A film of the upper left side similar to No. 1.
4. A film of the upper left side similar to No. 2.
5. A film of the lower right molar region.
6. A film of the lower right bicuspid and cuspid region.
7. A film of the lower four anteriors.
8. A film of the lower left cuspid and bicuspid region.
9. A film of the lower left molar region.
10. A film of upper centrals and laterals.

PULP CANAL OPERATIONS

This operation will, except in the hands of the men who have a proper conception of its place in dentistry, soon become a matter of history unless dentists perform it with the utmost caution and

use discretion in selecting the cases where it is indicated. It cannot be performed in a haphazard way. Nor is it indicated in all teeth and for all patients. It is my firm conviction that but a very small number of pulpless teeth should exist in any one mouth. To leave in any patient's mouth a great number of pulpless teeth more or less infected is not necessary and distinctly contraindicated. Do not misunderstand me. I am not condemning pulp canal operations, but I do most heartily and with all the emphasis at my command, condemn the abuse of this operation. No criticism ever uttered is too strong for much of the work that has been done under the guise of "treating teeth." At the present writing your essayist does not believe that if we have a systemic manifestation of an infection that is located around the root of a pulpless tooth, that we are performing the surest operation by simply doing a thorough pulp canal operation though we have cases on record where gratifying results are obtained by such procedure (36). The apical foramina are so minute through which to handle infected tissue beyond, it is somewhat trusting to luck to handle them in this way. Either extraction or curetment appears to be a much more rational treatment.

To tell when such an operation is indicated is to bring us back to our complete examination and it is that which I so desire to impress upon you. For it is only after a careful review of the patient's case, the present number of pulpless teeth, their condition and apparent amount of infection that we can decide such matters.

During the recent visit to the Mayo Foundation, I attended the dental clinic under the direction of Dr. Boyd Gardner and I want to lay great emphasis on what I saw there. Patients, too numerous to count, with infected pulpless teeth. Each one with from one to as high as ten, twelve, and fifteen, most of them carrying crowns, bridges and fillings. Several physicians were in attendance, and as the films of case after case were illuminated, I could not help noticing the mystified look on the faces of the visiting physicians. The work carried on at this institution is entirely from the standpoint of the patient's health, and they remove a diseased tooth for the same reason that they remove

a diseased tonsil or appendix. This work is in charge of a dentist and he uses great care in removing teeth and as a result; no vital teeth are needlessly sacrificed.

From our examination then, we may decide when a pulpal operation is indicated and, having properly prepared the mouth by eliminating pyorrhea conditions and removing infected teeth, we proceed with our case. Any decay in the tooth is carefully removed before the rubber dam is applied. The teeth included in the dam are wiped off with iodine and alcohol. If we are removing a vital pulp we inject our anesthetic previous to adjusting the rubber dam. After opening into the pulp chamber, place a pledget of cotton with a small amount of formalin on the pulp tissue. This will so toughen it that you can frequently remove it en masse. Then with a barbed broach fine enough to pass into the canal, remove the pulp. In a multirooted tooth, absorb the hemorrhage and place a dry sterile paper point in the canal and seal with oxymethylene of zinc cement while the other canals receive your attention. Try to get into the smaller canals with your finest barbed broach. If you cannot, use a short barbed broach; if not with this, try an apex broach, and if the canal is too fine, try a very smooth broach with sodium-potassium or sulphuric acid 30 per cent. With the latter, place the broach down in the canal to approximately the apex and with a drop of acid at the orifice of the canal, stir the broach in a sweeping motion, carrying the acid down along the broach and softening the dentinal wall we press it back thereby enlarging the canal. Remove the debris with barbed, short barbed and apex broaches. Place a dry sterile paper point in the canal, seal it until the other canals are attended to. When all are cleaned, place sterile measurement wires in and ray it. If the canals are sufficiently opened and you have no hemorrhage and have time to do so, complete your operation at this time. If you cannot complete your work at this appointment, seal very mild dressing of oil of cloves, seal tightly with oxymethylene of zinc cement, sealing each canal independently. Moisten cavity with xylol and seal cavity with temporary stopping.

In the case of a tooth the canals of which contain gutta percha but are incompletely filled, soften the gutta percha with

xylol and remove. After the gutta percha is removed, make a bacteriological examination of the canal contents and seal formo-cresol. Before the canal is again opened, we should have a report on the culture we have taken. The case is proceeded with, generally using sodium-potassium, but the greatest care must be taken to not pass an instrument through the foramen until the apical portion of the canal is bacteria free. When it is and our ray shows no periapical destruction, we are ready to fill.

In the case of the teeth with the dead gangrenous pulp, our operation is fraught with a danger from beginning to end. In these cases more than in any other, we should be most cautious about promising the patient anything permanent in the way of a result. If we could have found the case before the pulp had died and from its decomposition having infected the dentin, it would have been a much simpler task.

As we proceed, culture the canal and cautiously wash it with 1 per cent chlorosene using pulp canal syringe. Seal formo-cresol. Next appointment remove dressing; penetrate slightly into canal using sodium-potassium but do not enter the apical third, neutralize with bichloride of mercury and dry carefully. Take another culture of the canal contents and seal formo cresol. Repeat this until the canal to the apex is bacteria free.

With a fine canal plugger, condense into the apex a piece of gutta percha cone moistened with rosin and chloroform, sealing the foramina. Ray to see that it is in place. Now with heavy barbed broach and Kerr files, remove as much of the infected dentin as possible by enlarging the canal. This is filled by carefully condensing gutta percha into it. Seal the orifice with oxy-chloride of zinc.

STERILIZATION OF ROOT CANAL INSTRUMENTS AND MATERIALS.

The need of an adequate yet not too cumbersome method of sterilization has been long felt but for one reason or another they have proven unsatisfactory. Boiling, chemical and steam sterilization have all been tried. Of these steam seems the most promising.

Practically every well equipped office has an autoclave for sterilizing dressings, towels, cotton, etc., and it is by means of this

No. 36.
Conditions before and after cleansing ionizing and felling canals.

No. 37.
Sterilization of root canal instruments and materials.

method of sterilization that we prepare our instruments. They are lightly dipped in "3 in 1" oil and placed in test tubes either corked or closed with cotton and placed in the autoclave (37) (45). This method has a great many advantages. Chief among them being that of standardization. In each tube we have a complete set of instrument necessary for this operation. A set consists of:

- 2 Canal pluggers, fine and medium.
- 2 Short barbed broaches, fine and medium.
- 3 Universal Rhein picks, 2 fine and 1 medium.
- 2 Unmounted barbed broaches, xxx fine and fine.
- 2 Apex broaches, xx fine and fine.
- 2 Extra stiff heavy barbed broaches, fine and medium.
- 3 Kerr reamers, short handles, 2 extra fine and 1 medium.
- 2 Kerr files, " " 1 " " " 1 "
- 2 Kerr reamers, long " 1 " " " 1 "
- 2 Kerr files, " " 1 " " " 1 "
- 2 Instruments for opening constrictions.
- 1 Smooth broach, xxx.
- 1 Instrument for removing dentin.
- 1 Metal broach holder.
- 2 Rhein pulp chamber burs.
- 1 Drill.
- 1 Flame shaped bur.
- 1 Round bur.

Also, by this method we are able to sterilize cotton pellets, gutta percha points, etc.

As an introduction in deciding what should be the fate of pulpless teeth, this simple guide is offered. "Keep fully posted on what is going on in medicine and dentistry relative to mouth infection, put yourself in the patient's place and never under any circumstances advise anything for a patient you would not want done for yourself."

In considering a case involving pulpless teeth, we encounter certain teeth which belong to a class by themselves. They are what we call strategic teeth, on account of the position they occupy and their relation to the other teeth. In case they are lost it means the sacrifice of many other sound, healthy, but weaker teeth. Consequently we give to these teeth our special

attention. On them many times depends the question of a full denture.

In this work at present we are justified in acting on what we know and seldom on what we think will occur some time in the future. Consequently in considering this problem we must divide our patients into two classes. First, those who are perfectly sound physically. Second, those who are not. In the latter class, we are particularly interested in that group of cases diagnosed as focal infection cases.

Class 1. In cases of chronic antral infection where the case yields to no other treatment, we should remove pulpless molars and bicuspid on the affected side. This conclusion has been reached after observing the favorable progress of such cases under this treatment (38).

Class 2. In very serious cases where the internist's diagnosis has been that of metastatic infection, remove all non-strategic teeth showing the slightest signs of pathology. If symptoms disappear strategic pulpless teeth may be retained, but should early in our treatment have thorough pulp canal operations followed by apicoectomy if indicated and if possible. If it is indicated and they are not operable, they should be extracted.

In case the symptoms do not disappear and the tooth or teeth we are attempting to save are of extraordinary value strategically and do not show pronounced pathology, the internist should be again consulted and the case gone over with the hope of uncovering some source of infection. This is advised because of the fact that any man who assumes the responsibility of removing certain teeth the loss of which mean the wearing of a denture must do so with the full knowledge of the fact that every other possible source of infection has been removed and that he is not unnecessarily bringing this calamity upon the patient. (39.)

Class 3. Extract all infected 3d molars.

Class 4. Teeth with incompletely formed roots, containing gangrenous pulps, should be extracted in focal infection cases and as a general rule this procedure is indicated as a prophylactic measure.

Class 5. In those teeth in which pulp canal operations have been attempted and in which we find a persistent growth of

No. 38.
Infected pulpless bicuspid on same side as an infected antrum

No. 39.
The cuspid and molar are non-vital but apparently not infected.

No. 40.
Apical portion of canal persistently infected from surrounding infected tissues.

No. 41.
An acute abscess has just developed over the first bicuspid.

streptococcus or staphylococcus in the apical region of the canal. If these teeth are in a favorable location they may be resected, otherwise they should be extracted. (40.)

Non-vital teeth upon which it is permissible to perform root canal operations:

Class 1. Valuable teeth showing mechanically incomplete root canal operations and without periapical radiolucency or if they have periapical radiolucency if they are in a location where access is such that we can remove the infection by apicoectomy. This latter is in case the patient does not show any symptoms indicating the removal of the tooth.

Class 2. (41). Valuable teeth having dead pulps and similar conditions to Class 1.

Cases where it is permissible to remove a vital pulp:

Class 1. In teeth where a calcarious formation in the pulp is causing so much pain that it is a case of removing the pulp or removing the tooth.

Class 2. In case of severe pulpitis where the pulp will probably die and decompose. In these cases it is better to remove the pulp while it is still vital.

Class 3. In case of an exposure of the pulp in the preparation of a cavity or in the removal of decay, or an injury to the tooth.

Class 4. In cases of a tooth the coronal portion of the pulp only being infected.

Class 5. In isolated cases for bridge construction.

Cases when vital pulps should not be removed:

1. Never remove a pulp because of pain incident to cavity preparation.

2. Very seldom remove a pulp in bridge construction.

3. Never remove pulps for placing a splint on loose teeth.

4. Never remove a pulp for fear the tooth will ache in case a metal filling is inserted. It is better to place a temporary filling of gutta percha or cement.

5. Do not remove a pulp on account of gingival sensitiveness. There are other and efficient means of overcoming this trouble.

6. Never under any avoidable circumstances remove a vital

pulp from a tooth in a mouth where pulpless teeth have been removed to clear up an infection.

In the preceding pages it has been my effort to present to you a means whereby we may find ourselves in a better position in handling cases of pulpless teeth than formerly. As you can realize it is with some temerity that I present to you a classification incomplete though it is, of the various conditions we find in connection with pulpless teeth. I trust my efforts may be of some assistance.

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CHEMICAL STUDIES OF THE RELATIONS OF ORAL MICROÖRGANISMS TO DENTAL CARIES

BY WILLIAM J. GIES AND COLLABORATORS¹

8. A Study of the Types of Bacteria that occur in the Deposits on, and Material of, Human Teeth immediately over or surrounding Points that show the earliest possible detectable Dissolution of Enamel in typical initial Dental Caries.²

BY SYDNEY D. KRAMER³

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I. Introduction

At the conclusion of a general discussion of the bacteriological findings in his annual report for 1914-1915, the senior author wrote as follows:⁴

"I am about to endeavor, with the aid of every available resource, and the coöperation of all whose practical help may be given, to solve the problems that are indicated, *in general*, by the following questions (1-5)⁵:

"1. Which types of microörganisms, capable of producing and maintaining the conditions that seemingly *initiate* dental decay, occur invariably in the deposits on human teeth *immediately over or surrounding points that show the earliest possible detectable dissolution of enamel in typical primary superficial caries?*

"3. What are the distinguishing morphologic, chromologic, and bio-chemic qualities and peculiarities of the types of microörganisms that are responsible for the earliest phases of dental caries?"

¹ For previous contributions in this series see Gies and collaborators: JOURNAL OF THE ALLIED DENTAL SOCIETIES, 1915, x: (1) p. 137; (2) p. 141; (3) p. 282; (4) p. 445; (5) p. 459; (6) p. 464; (7) 1917, xii, p. 463.

² Third section of the report, for 1915-16, of findings in investigations conducted under the auspices of the First District Dental Society of the State of New York, and presented at the meeting of the Society, at the New York Academy of Medicine, November 6, 1916. The first and second sections, and two supplementary portions, of that report were published in the JOURNAL OF THE ALLIED DENTAL SOCIETIES; (1) 1916, xi, p. 659; (2) 1917, xii, p. 59; (1a) first supplement, 1917, xii, p. 65; (2a) second supplement, 1917, xii, p. 212.

³ Mr. Kramer succeeded Dr. Kligler to the assistantship in the bacteriological phases of this work, Dr. Kligler, at the conclusion of the work described in paper 4 of this series, having engaged in professional activity in bacteriology in another relation.

⁴ Gies: JOURNAL OF THE ALLIED DENTAL SOCIETIES, 1915, x, p. 473.

⁵ Questions 2, 4 and 5 are not quoted here.

This portion of the report for 1915-1916 describes an attempt to answer the foregoing questions.

II. Our Previous Findings

The preceding series of papers on this general subject presented the findings in studies of twenty specimens of deposits from healthy teeth and twenty from decayed teeth, each from a different individual.⁶ Of the latter, only three were from points of decay that involved the enamel alone.⁷

In the presentation and discussions of our findings we made the following remarks:

"Group 6. In this group there were three cases, in each of which the enamel only was affected. The dental deposit was very slight and the amount of scrapings in each instance was only 0.5 mgm. The striking results here are the abnormally high microscope-count, between 450,000,000 and 600,000,000 per mgm., and the comparatively high plate-count. It is noteworthy that the ratio here rises to 25:1, a figure far higher than the average for the normal samples, and that the plate-count for the semi-anaerobic conditions obtainable in the jar is appreciably higher than for any of the other plates. Another interesting feature that distinguishes this group . . . from the normal teeth is the occurrence in great abundance of certain types of bacteria that were present only rarely or not at all on the normal teeth." (Kligler and Gies: *Loc. cit.*, pp. 295-6.)

"The results of the study of bacteria of healthy teeth indicate, on the whole, that, while there is rise and fall in the total numbers of bacteria with the changing conditions in the mouth, the types of organisms and their *relative* abundance remain fairly constant.

"A totally different conclusion results from a correlation of the

⁶ Kligler and Gies: JOURNAL OF THE ALLIED DENTAL SOCIETIES, 1915, x, p. 282.

⁷ Our purpose in the earlier phase of this research was a general survey rather than a particular inquiry in this field. We preferred at the beginning (Kligler and Gies wrote) "to select as many distinct types (of cases—normal and abnormal) as could be conveniently handled without incurring risk of the confusions *that might result from premature extension of our studies at this (that) stage of their progress.*" For these reasons we were satisfied, at the outset, to present data for only three specimens of deposits pertaining to *initial* enamel decay.

Each of these three specimens was obtained at the Clinic of the New York College of Dental and Oral Surgery through the courtesy of Drs. Louise C. Ball and Frank L. Chambers, who made the diagnosis, in a general way, of the particular pathological condition in each instance. These diagnoses were not confirmed, however, by subsequent operative procedure, so that it is *possible*, though not probable, that the dentine was involved to some extent in one or more of the three cases.

data obtained from a study of *diseased* teeth. Here, too, there is a decided difference in the total numbers of bacteria present at the different stages or degrees of decay. Associated with this difference there is, however, not only a complete change in the character of the flora and the relative prevalence of types from that of the healthy teeth; but there is also a distinct difference between the types of bacteria in the early stages and those in the later periods of decay.

"*Primary caries* may, from the enormous counts and from the changed character of the prevailing flora, be considered a specific infection in which a limited number of types (perhaps three) are concerned. Just what is the predisposing factor or which of these types is most instrumental in bringing about decay, or whether we do not deal here with a true association of types, is hard to say. The significant facts are the (a) marked increase in the acidific bacilli, some of which are capable of producing and resisting an acidity of 8 per cent. *N* acid, and the (b) accompanying numerical increase in the long and short thread-forms, which can readily attach themselves in the form of compact colonies to any surface. One type of pleomorphic short thread-forming organism, growing in comparatively large colonies, has been observed regularly to attach itself to solid glass surfaces and to the wall of the test tube in liquid cultures, while in plate colonies it was often found enclosing one or two colonies of other bacteria. This type is relatively abundant in carious teeth. The relation this organism may bear to the concentration on a small area of a large number of active acid-producing rods is suggestive to say the least.

"The decrease in the number of streptococci at all stages of decay fails to support the prevailing view [Goadby, Sieberth, Kantorowicz, Baumgartner, *et al*] that streptococci are the important agents in caries. The foregoing evidence on this point is circumstantial and does not warrant any conclusions that step beyond the limits of the facts; but it is undoubtedly stronger than any proof that has hitherto been presented in favor of recognizing the streptococci or any other organisms as the causative agents in dental decay. For the present it is clear that the early stages of caries are bacteriologically due to one and the same process, characterized by a great increase in the total number of bacteria, accompanied by a drop in the relative number of cocci, and a marked increase in the number of acidific bacilli and thread-forming organisms.

"Goadby has observed the presence, in almost pure cultures, of an organism, from the deep layers of dentin, closely resembling the acidific bacillus and named by him *B. necrodentalis*; but he never associated decay of enamel and dentin with this form. Leber and Rottenstein, the pioneers in this field, long ago attributed caries to what they termed "leptothrices." The lack of correlation as well as the usual abundance of streptococci resulted in focusing attention on the latter as the etiologic agents of decay.

"Decay of the pulp . . . is a process that is different in character from decay of enamel and dentin. Associated in this process are a (a) relatively low bacterial count, a (b) drop in the relative number of cocci, similar to that found in primary decay, but differing from the latter also in showing a disappearance of the thread-forms, and the (c) presence in all cases of anerobic putrefying bacilli. The acidific type persists in practically the same abundance as in the initial stages of decay." (Kligler and Gies: *Loc. cit.*, pp. 312-13.)

"Under ordinary conditions the number of bacteria in a milligram of deposit on normal teeth, and cultivable on nutrient agar-plates, was about 1,000,000; when estimated with the microscope, 25,000,000. In "dirty" mouths the counts for dental deposits were about twice as high. The numbers of bacteria on unbrushed teeth were about four times as great as those on brushed teeth, while the count for normal dental deposits obtained immediately after meals was increased about three times that before the meal. In the first stages of caries, the numbers of bacteria in material from enamel cavities were 100 millions or more, whereas in similar material from cavities involving decayed pulp there were decided decreases, the numbers falling to about 40 millions per milligram.

"Qualitatively, the types of bacteria most prevalent in deposits on normal teeth were the cocci, which represented about 75 per cent of the total flora; 40 per cent of the cocci were streptococci. In the primary stage of caries the relative abundance of types was different from that in deposits on normal teeth; only 40-50 per cent of the forms were cocci, while the percentage of thread-forms rose to about 30 per cent (an increase of about 200 per cent), accompanied by a correspondingly large increase in the number of the non-spore-forming, actively acid-producing rods. In decay of the pulp, on the other hand, the cocci remained low in proportion, the thread-forms almost disappeared, the non-spore-forming rods continued to be quite as numerous as they were in the primary stages of caries, but a new form—an anerobic, putrefactive, spore-bearing rod—was found in large numbers.

"The bacterial types usually found in the deposits on normal teeth exerted but slight solvent action on powdered tooth in 1 per cent glucose-broth, whereas the types that prevailed in cavities in the first stages of enamel decay brought about marked dissolution of the powder. Putrefactive organisms from decayed pulp were devoid of solvent action on powdered tooth in glucose-broth." (Kligler and Gies: *Loc. cit.*, pp. 453-55.)

"The early stages of caries are characterized by a decided alteration in the relative abundance of types as they occur in deposits on normal

teeth. Three forms, the *B. acidophilus*, the *C. placoides*, and the *L. buccalis*, were prominent in the carious enamel deposits.

"In pulp decay an anerobic, spore-bearing, putrefactive bacillus, *B. putrificus*, was always prominent.

"The organisms prevalent in primary enamel decay very actively ferment the common sugars and bring about comparatively great dissolution of powdered tooth. The organisms in deposits on normal teeth and in the later stages of caries exert either slight effects, or none at all, in these relations." (Kligler and Gies: *Loc. cit.*, pp. 457-58.)

"This 'peep into a room full of interesting and important exhibits' revealed the presence there of three conspicuous bacterial forms of special interest: *Cladothrix placoides*, *Leptothrix buccalis* and *Bacillus acidophilus*. These three types were particularly prominent in material from cavities in superficial enamel decay. We have provisionally regarded two of these three forms (*C. placoides* and *B. acidophilus*) as possibly directly responsible factors, individually or together, in an infection that is productive of the initial stage of dental caries. (*That coccus forms are vanguards in this attack is a possibility we have not excluded.*) These types (*C. placoides* and *B. acidophilus*) grow vigorously in each other's presence, are actively fermentive in power, are capable of producing relatively large amounts of dentally destructive acid from the common sugars in ordinary culture media ('acidific'), and obviously can withstand the action of comparatively large proportions of the acid products of their own individual and associative fermentive activity ('acidophilic').

"*Cladothrix placoides* is notable, also, from the fact that, growing in relatively large colonies, it *adheres tenaciously to smooth surfaces* and tends to enclose in its colonies groups of other bacteria. These qualities suggest that this organism may be an important mechanical and chemical factor, ordinarily, in fixing, segregating, and concentrating, acidific forces on teeth, and in initiating and facilitating, thereby, acidic disintegration and penetration of enamel at such focal points. When we further reflect that viscid mucinate and delicate mucin threads would tend, respectively, to be adsorbed by, and entangled among, such adherent masses as *C. placoides* might be expected to develop at focal points on teeth, a mode of origin of 'mucin plaques' is at once suggested. A further fact of possible special significance in this particular connection was the observation, in our preliminary experiments in this regard, that sodium mucinate *stimulated growth of the two thread-forms* (*C. placoides* and *L. buccalis*)—presumably by providing *specially suitable nourishment!* Possibly mucinate and mucin, in mucin plaques, *stimulate the growth of acidific forms*, as well as provide more or less mechanical superficial protection to the bacterial colonies in the mucinous films?" (Gies: JOURNAL OF THE ALLIED DENTAL SOCIETIES, 1915, x, pp. 468-69.)

"It was stated above that *we have not excluded the possibility that 'coccus forms are vanguards in the attack'* that results in acidic penetration of enamel and the sequelae in caries. *A detailed bacterio-chemical study of deposits over and about points on teeth showing the earliest possible insignia of decay must precede final conclusions on this point.* It is by no means impossible that coccus forms *initiate* the solution of calcium and phosphate from enamel, and that *C. placoides* and *B. acidophilus* are stimulated to specially destructive focalization, with a diminishing proportion of coccus associates, as a result of local availability of special quantities of soluble calcium and phosphate produced in the manner suggested. The data in Table XXIV in the fourth section of this report (JOURNAL OF THE ALLIED DENTAL SOCIETIES, 1915, x. p. 452), as compared with the similar data on Table XXII in the same section, suggest that the growth of coccus forms may be inhibited by calcium phosphate and other calcium salts, but that the growth of *C. placoides* and *B. acidophilus* may be stimulated by such calcium compounds. I shall look carefully into these matters in the near future, and also give attention to the possible protective rôle of Nasmyth's membrane in this connection." (Gies: *Loc cit.*, p. 470.)

In a review of our work, Meyer has written as follows in this relation:⁸

"(1). The prevailing flora on the healthy teeth, whatever the condition of the mouth, is—on the whole—constant, while there is a rise and fall in the total numbers of bacteria with the changing conditions in the mouth. The number under ordinary conditions in one milligram of deposit consists of about twenty-five million organisms, of which one million can be cultivated. In 'dirty' mouths the counts were about twice as high. The predominating types of bacteria are streptococci and cocci (about 75 per cent. of the total flora; 40 per cent. of the cocci are streptococci). Environmental conditions naturally favor, in the different individuals, the development of predominance of the one or other type. The growth of oral microorganisms is just as much influenced by changes in the mouth as is the case for bacterial activity and growth in the soil or in the intestinal tract. The total number of bacteria increases during the night (sixty-eight million organisms per milligram) and immediately following a meal. The stagnant conditions in the mouth inducing concentration of fermentable carbohydrates causes a shift in the general relationship of the types to one another, a decrease of the cocci and increase of the forms characteristic for early stages of decay. The numbers of bacteria on unbrushed teeth were about four times as great as those on brushed teeth. Three times the number of organisms were

⁸ Meyer: *Journal of the National Dental Association*, 1917, iv, p. 986.

found in dental deposits immediately after meals than before meals. Brushing of the teeth, or chewing tobacco, removes about three-fourths of the total number of bacteria.

"One fact is well established: the types of organisms and their relative abundance remain constant, apparently.

"(2). The first stages of caries, which, in the opinion of Kligler can be considered a specific infection, show enormous counts and an entirely different flora from that of normal teeth. The number of bacteria in material from enamel cavities were one hundred millions to six hundred millions, and more. There are three types which, either alone or in association, are *suspected* of bringing about decay; they are the *B. acidophilus* (Moro), *Cladothrix placoides* and the *Leptothrix buccalis*.

"The *B. acidophilus* and the thread forms of *Cladothrix* and *Leptothrix* show in a primary enamel decay a relative increase of 200 per cent. over that found on normal teeth. All these organisms are fermenters of glucose and of maltose, some also of lactose and of sucrose. The "acidophilic" organisms are capable of producing ('acidific') and of surviving ('acidophilic') an acidity of 8 per cent. normal acid. On the other hand, the *Cladothrix placoides*—also called the short-threaded form—produces less acid, but has the property of clinging tenaciously to smooth surfaces. Kligler found in plate colonies that a network of *Cladothrix* threads sometimes enclosed one to two colonies of other bacteria. It is not unlikely that this organism may play some important rôle in fixing and initiating acidification and decalcification of the enamel at some small areas. This conception is particularly suggestive because chemical tests showed that a powdered tooth in 1 per cent glucose-broth is readily decalcified by *Cladothrix placoides* alone or in association with the *B. acidophilus*. The *Leptothrix buccalis* also attaches itself readily to smooth surfaces and is favored in its growth by salivary mucinate.

"From the presentation of these data it is quite evident that the two main forms, *Cladothrix placoides* and *B. acidophilus*, are perhaps responsible factors—individually or together—in an infection which produces the initial stages of dental decay. If further research confirms these observations it will not be difficult to suggest the best prophylactic treatment for the focally adherent microorganisms or the exclusion of fermentable matter from saliva and diet. One point in this connection is of interest. Gies,⁹ in his report on the work of Kligler, calls attention to the fact that these bacteriological studies fail to answer the questions of immunity to caries, localization of caries, and a sudden halt in the process, with eventual repair, because the mixed cultures (presumably *Cladothrix* and *B. acidophilus*) of a case with perfect immunity had just as marked decalcifying properties as any cultures from cases of true decay.

"(3). In the more advanced stages of decay (second and third

⁹ Gies: JOURNAL OF THE ALLIED DENTAL SOCIETIES, 1915, x, p. 467.

stages) just as in enamel and dentin involvement, the accumulation of débris reduces the bacterial count, not only as observed microscopically, but also as reported by actual plate counts. On the average, one hundred millions per milligram were found. The types of bacteria are about the same; facultative anerobic acidific bacilli predominate."

III. Experimental Data

In the extension of the work referred to in the foregoing sections of this paper, we confined our attention to the earliest detectable enamel decay and proceeded, by the same general methods as those described in the earlier reports, with the following special improvements in technique:

(1) Care was taken not only to select carious surfaces that *seemed* to be typical of initial enamel decay, but also to reject all specimens from such surfaces for which this preliminary diagnosis was not confirmed subsequently by thorough dental examination. (In the selection of cases for the previous study the latter precaution was not invoked.)

(2) The glass spatula employed to obtain scrapings from points of initial enamel decay contained a sharply pointed piece of platinum at the tip. This improvement enabled us to make a more complete removal of material involved in superficial decay than would have been possible with the original type of spatula devised for, and used in, the earlier work.

The dental material was obtained in the dental department of the Vanderbilt Clinic, at the College of Physicians and Surgeons of Columbia University, from patients selected there by Dr. James Howard Reed, who made all the diagnoses in this work. In response to our request for a statement regarding his procedure in this relation, in his co-operation with us, Dr. Reed reported as follows:

"I was asked to find cases in which decay had penetrated the enamel and had not advanced as far as the dentine. Clinically I found this extremely difficult, the proof in the ultimate analysis resolving itself into a question of relative judgment. I examined the pits and fissures of the bicuspid and the permanent molars, especially the distal pit of the superior twelve year molars. Cases of initial decay on the buccal and lingual surfaces of the teeth were not taken. (It should be remembered that

decay may occur at many places in the same tooth.) In no case was the tooth in question subjected to the mechanical injury of an explorer. The tooth was dried with sterile absorbent cotton and, if acceptable, a specimen was taken at a later morning. After the specimen was taken, the diagnosis was continued as follows:

"A fine probe was used, then a small bur. The dentine was discerned by:

1. A darker color; increased by phenol.
2. A softer structure, offering less resistance to the bur.
3. Presence of pain.

"The definition of initial decay and the nutritional defects (lessened calcification) and structural defects (non-union of enamel walls) of individual teeth will be called forth in a discussion of this diagnosis. Very few dentists think alike on these subjects."

Eighteen deposits, from as many individuals, were subjected to careful qualitative and quantitative examination. Nearly 400 strains of bacteria were isolated and studied in detail. Our results are briefly summarized in the succeeding section.

IV. Synopsis of the Findings

Streptococci.—Various members of this genus were found in all cases. The forms that fermented raffinose and salicin (*Str. viridans*) were most abundant. Among the remaining members of this genus were forms that corresponded in fermentation properties to *Str. II*, *Str. anginosus*, *Str. fecalis*, and *Str. pyogenes*.

Staphylococci.—The members of this group, mainly *Alb. candidus*, were also found in every case. With several exceptions they were of the white, *Albococcus*, variety (Winslow). These were almost equally represented by gelatin liquefiers and non-liquefiers. The remaining members were of the *Alb. epidermis* type. A few (5) were orange cocci, probably *Aurococcus mollis*.

Diplococci.—The Gram-negative diplococci were represented by members of three groups, in 40-50 per cent. of all the deposits.

The *first* group consisted of strains that fermented glucose and sucrose, produced ammonia but no indol, and had no action on milk—presumably *D. flavis II* (Lingelsheim).

The *second* group fermented glucose, lactose, and sucrose, and clotted milk, but did not produce indol in peptone solution—presumably *D. crassus*.

The *third* group failed to ferment any of the sugars, and produced no change in milk or peptone solution—presumably *D. catarrhalis*.

The group most generally found consisted of strains that fermented glucose and sucrose (first group).

Bacilli.—There were two *main* groups of bacilli: aerobic spore-formers and facultative anerobes. No strains of obligatory anerobes were isolated.

Aerobic Spore-forming Bacilli.—Two sub-groups of aerobic spore-forming bacilli were found in two or three cases; the representatives were very few in number. The strains of the *first* sub-group promptly liquefied gelatin and grew rapidly on agar, yielding, in a few days, a dry crusty growth—presumably representatives of the *Mesentericus* group. The strains of the *second* sub-group yielded a thin, somewhat brownish, growth on glucose-serum-agar and slowly liquefied gelatin—presumably *B. maximus*. (Goadby).

Non - spore - bearing Bacilli.—Excepting several strains of diphtheroids, all the non-spore-bearing bacilli in the deposits answered the same description and were characterized largely by a high degree of ability to produce acid. These rods were extremely minute and sometimes appeared in chains that looked like threads; at other times, or even in the same field, they appeared to be broken up into cocci. They did not produce indol or ammonia in peptone solution and did not liquefy gelatin. All were Gram-positive in young cultures and were extremely difficult to keep alive.

These organisms were found in 70 per cent of all the deposits, although they occurred in relatively smaller numbers when compared with the streptococci. This relatively low finding may be due to the great difficulty in isolating and starting the growth of this form on artificial media. In nearly all the above characteristics they agree with *B. acidophilus* (Moro) or *B. necrodentalis* (Goadby).

There were three strains of a bacillus that differed in appearance and staining properties from the forms referred to above, in presenting a somewhat granular or beaded appearance when stained with ordinary dyes—presumably *B. granulatus* (Kligler).

Trichomycetes.—We found two sub-groups of trichomycetes: one belonging to the *Trichobacteria* and the other to the *Trichomycetes* proper (Petruschky).

One type of the former group, a markedly pleomorphic organism, corresponded to *Cladothrix placoides* (Kligler) and was found in 40 per cent of all cases. Some liquefied gelatin while others failed to do so; some also fermented maltose, while all failed to produce ammonia or indol. Only five or six strains that corresponded to *L. buccalis* were found.

Of the branching forms, belonging to the *Trichomycetes*, only three were found—presumably *Leptothrix buccalis*.

V. Summary of General Conclusions

1. In all deposits the numerical preponderance of streptococci over all the other forms was the most striking bacteriological feature and, possibly, the most significant.

The deposits in practically all the cases were taken from crevices on occlusal surfaces on *bicuspid*s and *molars*, in which bacteria easily withstand the ordinary chemical or abrasive influences of food, tooth brushes and dentifrices. The persistent presence and continued action of such bacteria as the streptococci at these points of initial enamel decay—organisms that readily ferment all the common sugars and thereby produce relatively high degrees of acidity—suggest that streptococci may be important factors in *initiating* enamel dissolution as the *first* step in dental caries in such dental situations.

The sub-groups of the genus *Streptococcus* (nearly 200 strains of which were studied) most in evidence were *Str. salivarius* (*Str. viridans*) and *Str. II*. A large number (30 strains) failed to ferment any of the four differential substances (raffinose, inulin, mannite, and salicin): (*Str. anginosus*). Ten strains fermented mannite (*Str. fecalis*).

2. *B. acidophilus* was found in a larger percentage of cases

in our former study in this relation, and in almost pure culture in deep dentinal decay by Goadby (*B. necrodentalis*). It was found (28 strains) in 70 per cent. of the cases here reported, but in relatively small numbers in each instance.¹⁰ Judging from the present numerical findings, these organisms may not be as important as the predominating streptococci in *initiating* caries.

3. The peculiar adhesiveness of *Cladothrix placoides* implies that this organism is an important initial corrosive factor in or under mucin plaques, especially on free surfaces. The absence of this form from 60 per cent. of our deposits, and its relatively small numbers in 40 per cent. of the deposits, suggests, however, that this form is not *regularly* involved in any important degree in such cases of *initial* enamel decay as those studied in this work.

4. Only a few strains of the true *Leptothrix* were isolated. The rare occurrence of this form seems to indicate that it has practically no special influence in *initiating* primary caries.

VI

The relation of the findings in this study, and of those for the succeeding year, to the preliminary data published by Kligler and Gies, are indicated at the conclusion of the paper (9) following this one.

The details of these experiments will be published in full in an early issue of the *Journal of Dental Research* (see page 496).

We are greatly indebted to Dr. James Howard Reed, assistant in the dental department of the Vanderbilt Clinic at the College of Physicians and Surgeons, of Columbia University, for very earnest and helpful assistance in the selection of cases, and in their diagnosis, for this study.

¹⁰ In an extension of this work, as is related in the report for the succeeding year, *B. acidophilus* was found, through the agency of an improved method, in a larger proportion of the deposits.

CHEMICAL STUDIES OF THE RELATIONS OF ORAL MICROÖRGANISMS TO DENTAL CARIES

BY WILLIAM J. GIES AND COLLABORATORS¹

9. A further Study of the Types of Bacteria that occur in the Deposits on, and Material of, Human Teeth immediately over or surrounding Points that show the earliest possible detectable Dissolution of Enamel in typical initial Dental Caries.²

BY SYDNEY D. KRAMER

(From the Biochemical Laboratory of Columbia University, at the College of Physicians and Surgeons, New York.)

I. Introduction

The findings presented in this report, for 1916-1917, extend those in the third section of the report for 1915-1916, as outlined in the paper preceding this one (8) in this issue of the Journal.³

Our procedure, in the second phase of this special study, was practically the same as that described, for the first, in paper 8 of this series. Nineteen new specimens of dental deposits, from *assured* cases of initial caries in as many individuals, were subjected to general study. About 350 strains of bacteria were isolated from these deposits and studied in detail. (Twenty-one additional deposits were given a special examination for *B. acidophilus*.) The patients were examined, and material obtained, in the dental department of the Vanderbilt Clinic at the College of Physicians and Surgeons of Columbia University. The teeth were selected and the diagnosis made by Dr. James S. Shields, who followed the general procedure adopted, for the previous work in this particular relation, by our former colla-

¹ For previous contributions in this series see Gies and collaborators: JOURNAL OF THE ALLIED DENTAL SOCIETIES, 1915, x: (1) p. 137, (2) p. 141, (3) p. 282, (4) p. 445, (5) p. 459, (6) p. 464; (7) 1917, xii, p. 463; (8) 1918, xiii, p. 413.

² Third section of the report, for 1916-'17, of findings in investigations conducted under the auspices of the First District Dental Society of the State of New York, and presented at the meeting of the Society at the New York Academy of Medicine, February 4, 1918. The first and second sections of that report were published in the JOURNAL OF THE ALLIED DENTAL SOCIETIES, 1917, xii, (1) p. 360, (2) p. 463.

³ Kramer and Gies: JOURNAL OF THE ALLIED DENTAL SOCIETIES, 1918, xiii, p. 413.

in our former study in this relation, and in almost pure culture in deep dentinal decay by Goadby (*B. necrodentalis*). It was found (28 strains) in 70 per cent. of the cases here reported, but in relatively small numbers in each instance.¹⁰ Judging from the present numerical findings, these organisms may not be as important as the predominating streptococci in *initiating* caries.

3. The peculiar adhesiveness of *Cladothrix placoides* implies that this organism is an important initial corrosive factor in or under mucin plaques, especially on free surfaces. The absence of this form from 60 per cent. of our deposits, and its relatively small numbers in 40 per cent. of the deposits, suggests, however, that this form is not *regularly* involved in any important degree in such cases of *initial* enamel decay as those studied in this work.

4. Only a few strains of the true *Leptothrix* were isolated. The rare occurrence of this form seems to indicate that it has practically no special influence in *initiating* primary caries.

VI

The relation of the findings in this study, and of those for the succeeding year, to the preliminary data published by Kligler and Gies, are indicated at the conclusion of the paper (9) following this one.

The details of these experiments will be published in full in an early issue of the *Journal of Dental Research* (see page 496).

We are greatly indebted to Dr. James Howard Reed, assistant in the dental department of the Vanderbilt Clinic at the College of Physicians and Surgeons, of Columbia University, for very earnest and helpful assistance in the selection of cases, and in their diagnosis, for this study.

¹⁰ In an extension of this work, as is related in the report for the succeeding year, *B. acidophilus* was found, through the agency of an improved method, in a larger proportion of the deposits.

1. The first part of the paper is devoted to a general discussion of the problem of the existence of solutions of the system of equations (1) for arbitrary values of the parameters α and β . It is shown that the system has solutions for all values of the parameters α and β if and only if the condition $\alpha + \beta > 1$ is satisfied.

2. In the second part of the paper the question of the stability of the solutions of the system (1) is considered. It is shown that the solutions of the system are stable with respect to the initial conditions if and only if the condition $\alpha + \beta > 1$ is satisfied. It is also shown that the solutions of the system are stable with respect to the parameters α and β if and only if the condition $\alpha + \beta > 1$ is satisfied.

3. In the third part of the paper the question of the asymptotic behavior of the solutions of the system (1) is considered. It is shown that the solutions of the system approach zero as $t \rightarrow \infty$ if and only if the condition $\alpha + \beta > 1$ is satisfied. It is also shown that the solutions of the system approach zero as $t \rightarrow \infty$ if and only if the condition $\alpha + \beta > 1$ is satisfied.

4. The author wishes to thank the Ministry of Higher Education of the USSR for the support of this work.

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and under such mucin plaques, especially on free surfaces. This organism was present in 69 per cent of our carious deposits, although it regularly appeared in relatively small numbers.

4. Only a few strains of true *Leptothrix* were found and isolated. This rare occurrence seems to indicate that this form has practically no special influence in *initiating* penetration of enamel.

5. These conclusions agree in the main with those from our results, reported a year ago, in a similar study of initial enamel decay (paper 8).

IV. Relation of the Later Findings to the Previous Analogous Observations in These Studies

It was found by Kligler and Gies (*loc cit.*) in the preliminary survey in this field, for three specimens of deposits from points of initial enamel decay, that "three forms, the *B. acidophilus*, the *C. placoides* and the *L. buccalis*, were prominent" in such deposits. Two of these three forms (*C. placoides* and *B. acidophilus*) were provisionally regarded as possibly directly responsible factors, individually or together, in an infection that is productive of the initial stages of dental caries, though it was stated that the *possibility* that "coccus forms are vanguards in this attack, had not been excluded."

Our findings in the report for 1915-'16 (paper 8, preceding) and for 1916-'17 (this paper), on many more deposits from points of initial enamel decay, by the same or improved methods of diagnosis and bacterial differentiation, agree in principle with those of the preliminary survey, especially in emphasizing the probable importance of *B. acidophilus* and *C. placoides* as causative or *contributive* factors in primary dental caries. Our more extensive findings in these two special studies of *initial* caries warn us, however, that the constant occurrence, the numerical preponderance, and the biochemical properties, of the streptococci, in the deposits from such cases, may imply that these forms are important factors in the *initiation* of the carious process.

We do not overlook, in the foregoing deduction, the fact that streptococci are normal inhabitants of the oral cavity, that they occur in the human mouth in very large numbers, and that, there-

fore, their conspicuity in deposits from initial caries may be incidental rather than significant. The ready capacity of the streptococci, and of *C. placoides* and *B. acidophilus*, to produce acid from carbohydrate justifies the assumption that one or all of these forms are capable of *initiating* dental caries, *provided* that sufficient numbers of organisms are assembled at a given point on a tooth, often or long enough, in the continuous or frequently repeated presence of ample supplies of carbohydrate, to produce amounts of acid that are adequate in power and proportion to effect corrosive penetration of the enamel.⁵

A study of the causes of dental focalization of bacteria—of focal bacterial attack on the teeth, if we may call it such—as well as the kinds and effects of the different acids produced by the influential organisms is involved, of course, in an extension of this series of investigations.

V.

The details of these experiments, with extensions since the date of the meeting at which this report was submitted, will be published in an early issue of the *Journal of Dental Research* (see page 496).

We are greatly indebted to Dr. James S. Shields, Assistant in the dental department of the Vanderbilt Clinic at the College of Physicians and Surgeons, of Columbia University, for courteous and efficient cooperation in the selection of dental deposits for this study and in the diagnosis of the dental conditions they represent.

⁵ See the JOURNAL OF THE ALLIED DENTAL SOCIETIES, 1917, xii, p. 463, for a discussion, by Kligler and Gies, of recent papers in this relation by Howe and Gillette and by Howe and Hatch.

THE JENKINS FUND FOR DENTAL RESEARCH

An Account of Its Use in the Public Service, and the Items of Its Expenditure

By WILLIAM J. GIES

Toward the close of the presentation of my annual report of research, to the First District Dental Society of the State of New York, on November 1, 1915, I called the Society's attention to the great difficulty of directing and conducting effectively a particular series of researches in bacterio-chemistry on an annual appropriation of a few hundred dollars. At the conclusion of my report there arose from the audience a gentleman I had never, before that evening, had the pleasure of meeting, who, in an appreciative and gracious manner, stated that he would immediately contribute \$1000 to facilitate the research in which we were then engaged and which, I had said to the Society, we hoped to extend. A few days later I received from him a check for \$1000 and a letter of which the following is a copy:

Nov. 2nd, 1915.

DEAR PROFESSOR GIES:

Please accept the enclosed cheque for \$1000, payable to your order, as an unconditional contribution to the research work in Dentochemistry, in which you are engaged.

Believe me, with much esteem and many good wishes,

Yours very sincerely,

(Signed) NEWELL SILL JENKINS.

My acceptance of the trusteeship of this generous and timely gift was expressed in the following reply:

Nov. 5, 1915.

DEAR DR. JENKINS:

I received, on Wednesday, your check for One Thousand Dollars (\$1000.00), given to me, in accordance with the terms you state, as a gift without condition other than that it be used for the furtherance of research in Dentochemistry.

Permit me again to extend to you, on behalf of the First District Dental Society of the State of New York, which I have the honor to represent, its most earnest thanks for your very helpful contribution in support of the research that is now in progress under its professional auspices.

Your fund will enable us materially to extend the scope of our research and to undertake investigation that would have been impossible without the assistance you have given. I shall give myself the very great pleasure, in administering the fund, under the auspices of the First District Dental Society, to arrange for such a form of publication of the expenditures from the fund as will permanently memorialize the spirit of liberal support of investigation that your generosity exemplifies.

I delayed my acknowledgment until tonight in order that I might write it after the adjournment of a meeting of the Board of Directors of the First District Dental Society of the State of New York at which, I anticipated, your fund and other financial matters relating to research would be discussed.

There were not only very cordial expressions of appreciation of your gift, but also more marked evidence of a purpose to provide funds in larger proportion, in addition, for the necessary expenses of an extension of our research, than had ever before been shown. I attribute this desirable result, in large degree, to the impetus that your own liberality imparted.

It was a great pleasure to meet you, and a profound satisfaction to hear your approving comment; and I hope I may have the gratification of successfully administering your fund to the abiding benefit of dental science.

Believe me, with highest regard,

Yours sincerely,

(Signed) WM. J. GIES.

After full and independent consideration of my personal responsibility, as the *designated* trustee of this fund, I concluded to use the fund *primarily* in support of bacterio-chemical research under the auspices of the First District Dental Society of the State of New York, but also, *secondarily*, in behalf of research under the auspices of the Dental Society of the State of New York and under the auspices of the Research Institute of the National Dental Association, for each of which organizations I was then conducting investigations. Later, the fund was also used in support of a special study of "ionism," now in progress. To accomplish this broad purpose most effectively, the total amount

of the fund was paid by me to the Treasurer of Columbia University, and expended in the official way for designated supplies, for the promotion of dental research.

Upon my requisition this fund was drawn upon to the extent of \$744.31, to and including June 30, 1916 (the end of the University's fiscal year of 1915-'16), and in the amount of \$255.69 (balance), to and including December 31, 1916, when the fund was exhausted.

The expenditures from each of these portions of the fund, comprising a total of \$1000, are itemized on official University records as follows:

A.—November, 1915—June, 1916:

1915—11/19	1 4-Lamp illuminator.....	\$ 39.00		
12/1	1 Hot air sterilizer.....	20.00		
12/29	1 Kohlrausch slide-wire bridge.	68.65		
1916—1/13	1 Freas electric incubator.....	127.40		
1/28	12 Rat cages, special design.....	52.92		
2/14	1 Bramhall-Deane autoclave ...	148.75		
2/18	6 Rat cages, special design.....	26.46		
3/7	1 Leitz microscope.....	144.50		
4/4	1 Inspissator	25.00		
For labor and material, paid to the Department of Building and Grounds, for wiring, piping, and installation, of various pieces of ap- paratus named above:				
1916—4/20	.....	\$71.15		
6/20	.....	20.48	\$91.63	\$744.31

B.—June—December, 1916:

10/26	1 Leitz dark-field condenser....	16.00		
11/1	6 Rat cages, special design.....	28.00		
11/19	1 Large revolving digester.....	29.47		
12/29	Paid to the Department of Build- ings and Grounds for magnesite cement cover for steam piping to autoclave and on latter— \$26.75; assessed against this fund	18.22		
12/31	Paid to S. S. White Co. for mis- cellaneous supplies, including dental engine	164.00	255.69	\$1,000.00

In an official report regarding this fund, addressed to the Trustees of the University, on June 30, 1916, I wrote, in part, as follows:

"In harmony with Dr. Jenkins' liberal purpose, I am devoting this gift to the purchase of apparatus which the University could not provide from its current funds, and which also could not be obtained at the expense of any (or all collectively) of the small appropriations for dental research now received by us annually from the First District Dental Society, the Dental Society of the State of New York, and the National

Dental Association, without seriously disarranging the plans for the work in progress under the auspices of these three dental societies.

"Dr. Jenkins' gift has had the merit of exceptional timeliness and utility. It has enabled us to purchase supplies that we could not otherwise have obtained. The enlarged equipment thus provided has greatly amplified the scope and increased the efficiency of each of our investigations under the auspices of the three dental societies mentioned above, and it has facilitated extensions of the researches that otherwise would have been physically impossible to effect."

In formal statements to officers of the First District Dental Society of the State of New York, the Dental Society of the State of New York, and the Research Institute of the National Dental Association, I referred, in part, as follows (in August, 1916), to the way in which Dr. Jenkins' gift had been used:

"The apparatus purchased with Dr. Jenkins' gift constitutes permanent equipment continuously in use in the work we are doing under the auspices of the First District Dental Society, the State Dental Society and the National Dental Association. His contribution is, in effect, from the nature of my administration of it, a gift to the three dental Societies involved and to the University. The balance will be expended shortly for another essential addition to our equipment. We are, Societies and University, very greatly indebted to Dr. Jenkins for the generous addition to our resources his gift has effected."

In a letter to Dr. Jenkins, dated August 24, 1916, I wrote:

"I have endeavored to administer your gift in a way to insure *lasting benefit* to the various kinds of research we are endeavoring to conduct. It gives me great pleasure to send you herewith copies of my various letters to the Bursar of Columbia University, representatives of dental Societies, and others, explaining, in detail, just how the money has been expended.

"I wish to assure you of the fact that we have been able to proceed in our researches very much more effectively than would have been possible without your gift, and that much of any success we may attain in the future will be due, cumulatively, to the permanent additions to our equipment that your gift has made it possible for us to assemble."

Dr. Jenkins' gift was used *exclusively for permanent equipment* that was essential to further progress in our researches, and which neither the University nor the dental Societies involved

were free to supply. Papers 8 and 9 in the bacterio-chemical series, in this issue,¹ present data of researches that could not have been conducted by us, if it had not been for the timely support Dr. Jenkins' generosity afforded.

I take this means publicly to acknowledge gratefully our indebtedness to Dr. Jenkins for a generous gift that was bestowed upon us unconditionally for the advancement of dental knowledge, and which it has been a pleasure and an honor to administer, in the public service, for the promotion of dental science.

*Biochemical Laboratory of Columbia University,
College of Physicians and Surgeons,
New York City.*

¹ Kramer and Gies: JOURNAL OF THE ALLIED DENTAL SOCIETIES, 1918, xiii, pp. 413 and 425.

REPORTS OF SOCIETY MEETINGS
FIRST DISTRICT DENTAL SOCIETY OF THE
STATE OF NEW YORK,

October 7, 1918

A regular meeting of the First District Dental Society of the State of New York was held on Monday evening, October 7th, 1918, at the Academy of Medicine, No. 17 West 43rd Street, New York City.

The President, Dr. Arthur H. Merritt, occupied the chair, and called the meeting to order.

The Secretary read the minutes of the last meeting, which were approved.

Dr. George A. Thompson, of Chicago, read a paper entitled: "The Porcelain Jacket Crown."¹ The paper was illustrated by lantern slides.

Discussion on Dr. Thompson's Paper

Dr. J. W. Scherer—The paper we have listened to this evening is of large calibre, and being as it were the opening gun of the 1918-19 season of this society, it forecasts a successful and interesting winter.

I had the good fortune to hear Dr. Thompson last year and to be present at several of his clinics. His technic at once impressed me as being not only scientific, but definite and workable. With a great many other men I had not the proper understanding of this type of restoration, and underestimated its value and possibilities. I at once set out to rectify this error and to make up for lost time, and tried to follow Dr. Thompson's technic to the letter. So it is from the standpoint of the beginner that I want to say a few words regarding my early struggles with the porcelain jacket crown restoration.

¹ See Dr. Thompson's paper in full at p. 334, this issue of THE JOURNAL.

The preparation of the tooth did not prove nearly the bugbear that one might suppose. The enamel is easily stripped off if the outlined technic is followed. I do think, however, that a beginner will find himself freer to pursue his shoulder preparation if conductive anesthesia is used, but as Dr. Thompson has said, the operator must have satisfied himself as to the condition of the pulp of the tooth in question. In cutting the shoulder, the beginner's zeal leads him to cut too wide, especially at the mesio-labial and disto-labial junction.

I have found it very helpful to have my assistant direct a strong blast of air at the point of the fissure bur. This lifts the gingival margin sufficiently to afford a good view. Stop now and then and with your electric mirror and strong air blasts examine your progress. A magnifying lens is of great help here. I like to plane the stump with very sharp thin chisels, which gives a sharp junction to the shoulder. Note particularly how Dr. Thompson carries out the preparation of the occlusal surface. All planes are made at right angles to masticatory stresses. This is just another detail of his technic, the observance of which may be the determining factor of success or failure.

Dr. Thompson lays great emphasis on covering the stump with some form of protective varnish, especially when the tooth under treatment is a vital one. I apply in such cases Howe's ammoniacal silver solution followed with the 10% formalin solution to produce the silver deposit in the dentinal structure. Nearly all the discoloration which ensues can be bleached out by a thorough swabbing with Lugol's solution (which is KI plus I solution) followed by alcohol.

For a successful impression, I have found that the copper cylinder must be of the proper size before the shoulder is cut and it should be festooned to a nicety. Even the beginner should have no difficulty in obtaining his modelling compound impression and bite. A sharp imprint of the stump must be obtained in the bite wax because one of the most important points is to place the amalgam reproduction of the stump accurately in the bite wax.

Dr. Thompson's method as outlined certainly procures ac-

curate results, but I find I get results and save time in using the wax bite method as follows: The patient is instructed to close on a roll of softened Tenax and the occlusion of the opposite side is noted. Compressed air is then directed against the wax to chill it. The wax bite is removed and chilled for a moment in cold water. A few blasts of cold air are used to dry the area corresponding to the imprint of the stump in the wax. Into this imprint I now place two drops of adhesive wax, S. S. White's crown wax is good for this purpose, and while still soft set the bite back into place, using the approximating teeth of the stump as a guide, and ask the patient to close. The opposing teeth find their respective imprints in the wax. Upon renewal, we find a very sharp definition of the stump, into which the amalgam model fits perfectly. The case is then articulated in the usual manner.

Before dismissing the patient do not neglect to cover the stump by any method found most feasible, for it is quite necessary to keep the gingiva from crowding over the shoulder.

My first attempt to form the platinum matrix ended disastrously, so did the second *and* the third. I stopped right there and walked around the block, then started again to find out where the trouble lay. Using a micrometer, I discovered that I was using foil measuring only one-half thousandth of an inch. After obtaining one thousandth of an inch foil I had not so much difficulty. After a little practice, the making of a matrix becomes a matter of three to ten minutes.

If you have burnished your matrix perfectly—I do the final burnishing by wrapping the amalgam root and matrix in a Johnson & Johnson doily—you might find it impossible to remove the matrix without distortion or even tearing. Always see to it that the matrix removes before building up the porcelain on it. I have found that if I flow inlay wax all over the matrix, it is stiffened and can be handled strenuously and safely removed. After removal hold it in the Bunsen flame and burn clean.

In selecting the shade the novice is apt to get the gingival portion of the crown too light. I found No. 5 Justi to answer better where No. 4 was seemingly indicated. In making a bicuspid crown, if the lingual cusp is built up by selecting a shade

containing more gray than the buccal cusp, the results are much more satisfying. These color blends mean more as we advance in this work. Dr. Thompson has treated the science of color most exhaustively in his paper. I must confess it was startling to me to note the influence the various physical factors exerted on the shade of the tooth. Time spent in experimenting in this direction is well spent indeed. It is surprising how soon after taking up this work one's appreciation of the various shades of teeth in the same mouth increases. Nearly every porcelain tooth I have occasion to use today, I find can be improved in shade and shape by recourse to my porcelain and furnace. The results more than warrant the extra time expended.

The suggestion Dr. Thompson makes of acquiring a collection of natural teeth is a splendid one. The larger the collection the better. That to my mind is the best way to study the many peculiarities, surface markings, etc., that in the past have gone unnoticed. In this work the novice soon discovers that dental anatomy takes on a new meaning; he will not only build up marginal ridges, cusps and proper gingival restorations in his porcelain work, but his inlay and other restorative procedures will improve in proportion.

I have mentioned gingival restoration. Let us not pass over this lightly. Dr. Thompson says: "The enamel we remove from under the free margin of the gum, we must *reproduce* in our crown again to give this investing tissue its normal tension." If we carry away with us this evening only this one thought, Dr. Thompson's paper will have been immeasurably worth while. Every now and then I have occasion to inspect a crown restoration of five or six years' standing, where the enamel had been properly removed and the band perfectly fitted, to find to my chagrin that where the band hugged the stump tightest, the gum had receded, and in that same mouth perhaps I find another crown where I had found it necessary to spin in the gingival portion of the crown and in that case the gum is normal and there is no recession. The reason for this difference? Simply that in the latter I unconsciously restored that enamel bulge under the free margin of the gum and did not do it in the former. It seems to me that this matter of reproducing the gingival

anatomy should receive very careful consideration in our bridge-work.

The question of staining our porcelain teeth has been fully covered in the paper. To quote Dr. Thompson again: "We have failed miserably unless we imitate the discolorations that are always found in various degrees in the teeth of patients requiring porcelain restoration. Such a crown will stand out even to the layman as a monument of our inartistic ability." Surely further discussion on this point is superfluous.

In cementing the crown, you noticed Dr. Thompson said to seat it under light pressure. On this point I once slipped a clog. I proceeded to cement a lower molar crown and the cement I was using in the case was mixed a trifle too stiff. Add to that a stick of wood and forceful pressure and you may draw your own picture as to what happened. I believe the crown exploded. But then the second one is always better.

There is no need to reiterate the advantages of the porcelain jacket crown over other types. I cannot refrain, however, from speaking of its wonderful appearance at the gingival line. The finished crown, containing no metal whatever, cannot be distinguished from the approximating natural tooth at this point and patients are wont to remark: "I never have had a crown put on that was so comfortable around the gum, with no soreness after cementing." I have experienced such great satisfaction from the use of the porcelain jacket crown, that only the inability to obtain the materials needed for its construction could make me return to the other forms of crowns.

The porcelain technic is established on firm foundation. It has become an institution. Institutions are often but the lengthened shadow of a single man. Men like Dr. Thompson make it possible for us, his followers, to reap the fruits of his tireless investigations and to share with him the joy that comes from rendering a higher service to our patients than ever before. He came to us today with no other motive than to encourage other men to take up this type of work. Dr. Thompson's technic is so definite that anyone can follow it and obtain results. To my mind he has taken the "myst" out of the mystery pertaining to this work. Next year there should be fifty, a hundred, two

hundred more men than now, right in this audience, to be eager to get up here to cite their experiences concerning their porcelain jacket crown work.

Dr. Arthur N. Davis—A program was handed to me, on which appeared the name of Dr. John B. Davis, as taking part in the discussion, and mentioning the fact that Dr. Davis is credited by Dr. Thompson with knowing more about this subject than most of the other men in the country put together. As Dr. John B. Davis is not present and as my name happens to be Davis, I was asked to take his place.

I have made porcelain jacket crowns for a number of years but I have not made three thousand, as Dr. Thompson has, but nearer three hundred. I have only made these crowns of S. S. White 2560 porcelain. I have had no experience with the Justi porcelain.

There are times when I have been disappointed. I made for one patient two central incisors, right and left, at the same time, mixing the porcelain at the same time and baking them at the same time, and I secured, unfortunately, two different results—that is, after cementing them, they did not look the same. One crown seemed to have been made from a different porcelain than the other. I attributed that to one crown's being thicker than the other, or one root's being trimmed down more than the other. Although made of the same mix, and baked at the same time, the crowns did not look exactly the same.

The blocks of shades furnished with the S. S. White porcelain are rather thick, therefore they lack transparency and are misleading. Dr. E. S. Fuller of Dayton, Ohio, made his own shades from the S. S. White porcelain which comprised about two hundred and seventy-five shades in all. He mixed by weight No. 1 with No. 2—No. 1 with No. 3—No. 1 with No. 4—and so on. He went through the same work with all the fifteen shades. The shades when completed were in the form of square blocks and about the thickness of a finished jacket crown.

The most important point about the matrix, I think, is to keep it from shrinking. After the matrix is made, if you cut it out or festoon it on the proximal sides, add the porcelain and put it upright in the furnace to bake, your matrix will only rest

on the labial and lingual portions, which will cause a drawing of that matrix, and your crown will not fit. You must cut the matrix evenly all the way around so that when you place it upright in the furnace the entire circumference will be supported. I have never had a crown shrink since I have done this.

With a matrix so prepared it will be impossible in certain cases to fit it on the tooth in the mouth after the first bake, as the gum on the proximal surfaces will interfere.

Adjournment.

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK

November 4, 1918

A regular meeting of the First District Dental Society of the State of New York was held on Monday evening, November 4th, 1918, at the Academy of Medicine, No. 17 West 43rd Street, New York City.

The President, Dr. Arthur H. Merritt, occupied the chair, and called the meeting to order. The paper of the evening was read by Prof. C. N. Johnson, M.A., L.D.S., D.D.S., of Chicago, and was entitled: "The Need of a Stabilizer in Dental Practice."¹

Discussion of Dr. Johnson's Paper

Dr. E. T. Darby, of Philadelphia—It is always a pleasure to meet Dr. Johnson; it is always a joy to hear him speak. I know from the enthusiastic applause you gave his paper that you are in hearty accord with the sentiments he has expressed. I have known Dr. Johnson a great many years, and I have put great faith in what he has said. As a teacher, it is my duty and my privilege to read the text books which have been written upon dentistry, and when I want to be perfectly orthodox in my teachings, I consult Dr. Johnson's books. If I want good practical common sense, I find it in what Dr. Johnson says or does. Furthermore, when I sit in my den at night, and count the beads on my rosary, and try to think of all the dear men in the profession, my mind reverts to the Marshall Field Building in Chicago, and I think of Dr. Johnson as being one of the most ethical and one of the most charitable of men—and I use the word charitable in the Scripture sense: "Faith, Hope and Charity, and the greatest of these is Charity!" If a patient of mine falls into Dr. Johnson's hands, and he finds a mouthful of bad work, he casts a great big mantle of charity over it, and he will not

¹ See Dr. Johnson's paper in full at p. 323, this issue of THE JOURNAL.

say anything disparaging about the work or the man who did it.

Dr. Johnson has mentioned a number of things in the history of the dental profession where a stabilizer would have been of great service to the practitioner. My mind goes back forty years to the time when the "New Departure Doctrine" was engaging the attention of the profession. For younger men who may not know what that was I will state it in as brief an outline as possible.

Dr. J. Foster Flagg of Philadelphia made this statement to the dental profession: "Just in proportion as teeth are bad and need saving, gold is the worst material with which to fill them." He was seconded in this statement by Drs. Henry Chase of St. Louis and S. B. Palmer of Syracuse. It was a challenge which the better men of the profession of that day resented, and many men resent it today.

In looking over the *Dental Cosmos* for the year 1880, vol. 22, page 69, I find the following from a paper by Dr. Flagg on gutta-percha:

"As a result of over fifteen years of careful observation, and with a basis of over 2,000 replacements of gold with gutta-percha, I find that, properly used, gutta-percha is at least twice as durable as gold, and that in very soft teeth, in selected places, it is fair to presume it will preserve the teeth at least three times as well as the best introduced gold fillings. I wish it to be understood by the profession that I do not make this statement as an opinion, but as an assertion, vouched for by long carefully tabulated records, and as a basis upon which the operators of the future may find a satisfactory tooth-saving and comfort-giving practice."

Gutta-percha has its place in dental practice, but it is not usually considered a permanent filling material.

Many of you have seen gold fillings which have lasted forty or fifty years. Last night I saw in the mouth of my friend Dr. S. H. Guilford, who was a classmate of mine in college, a large gold filling in good condition which I inserted in 1865—fifty-three years ago. If Dr. Flagg's gutta-percha fillings would last three times as long, they should be good at the end of 159 years.

Only a few years ago I saw fillings of gold in the proximal

surfaces of the incisor that Dr. Elisha Townsend of Philadelphia had inserted sixty years before. If Dr. Flagg's gutta-percha fillings were three times as good, they should last 180 years. I once saw some fillings of Edward Hudson's that had then lasted seventy years. If gutta-percha fillings were three times as lasting they should be good at the end of 210 years.

Nor was that all. Those men of the New Departure school claimed that amalgam and phosphate of zinc and other plastics were better tooth savers than gold, and they had a large following of men who were glad to adopt some easier method of filling teeth than the laborious one of packing gold. What the profession needed then was a stabilizer.

I am free to admit that many teeth have been saved by amalgam and many of the plastics, but I cannot admit that any material is more lasting than well-made gold fillings. Hence I predict that the day is not far distant when the dental profession will use less of the silicate cements, less phosphate and less amalgam, and will return to the use of gold foil for all fillings of moderate sizes posterior to the six incisal teeth, and in cavities of greater size will make use of the gold inlays.

Dr. Johnson has spoken of cataphoresis, and the disappointment which followed its introduction. A stabilizer was much needed at that time.

I remember a clinical demonstration which one of our most distinguished Philadelphia dentists made with it. He invited three or four of his colleagues to witness the operation. He had set apart an hour for the patient in the chair. At the end of forty-five minutes he had desensitized the dentin and had but fifteen minutes left to prepare the cavity and fill it with gold. Of course another sitting was necessary to complete the operation. Many others who had expended a considerable amount of money for apparatus soon relegated them to the laboratory shelf and cataphoresis was a thing of the past.

Quite recently analgesia engaged the attention of certain members of the profession and extensive apparatus has been exploited and considerable number of them purchased by dentists who were convinced that there was no better manner of making

dental operations popular than by making them painless, and it may be true that many operators have greatly increased their clientele by the use of analgesia. If I am rightly informed, scores of dentists who were most enthusiastic in their commendation of the method have since relegated their apparatus to a spare closet or use it but seldom. Perhaps a stabilizer would have been a money-maker as well.

And now a greater and more serious problem is confronting both the medical and dental profession. Dr. Johnson has comprehensively and fairly stated the case and has quite properly suggested that a stabilizer at this time might prove of great value and perhaps be the means of saving many valuable teeth. You older men can doubtless remember when all disease which was difficult of diagnosis was attributed to malaria, and ten or twenty years later malaria was almost unknown and gout was responsible for the ills from which people suffered. There was gout of the throat, gouty iritis, gout in the teeth and jaws. And now all hidden or obscure lesions arise from the apices of the roots of the teeth. The essayist has given us the history of this general belief on the part of the medical and dental practitioner. It behooves us to be perfectly fair in our statements and I am free to say that if I had in my mouth a devitalized tooth which I knew to be the cause of bacterial infection I would have it removed at once. Or if a patient of mine had such a tooth I would advise its removal if I felt sure that I could not remove the disease and render my patient entirely free from the danger of such infection. But I am unalterably opposed to the extraction of all teeth simply because they have lost their pulps and show at near their apices a slight rarefied area or a papilla upon the gum or sinus leading to the apex of the root. Your observation and experience will warrant you in stating that hundreds of such teeth have been made good and serviceable and all evidences of disease eradicated.

The details of such cases are tedious, but I cannot refrain from the mention of one or two. I was asked to sanction the removal of a tooth which had a slight papilla upon the gum from which pus was sometimes escaping. The patient had suffered from neuritis in the arm and shoulder and the medical adviser

concluded that the diseased tooth was the cause of the neuritis. I learned that the patient had some months before had a gangrenous appendix removed and had subsequently had an abscess of the rectum—two sources of infection, but neither of which was half as important in the estimation of the physician as the slight fistula at the apex of the single-rooted tooth.

Another case was that of a lady who had pains in her feet, especially after standing or walking. She was told by the physician whom she consulted that it must be from her teeth as he could find no other cause. She was sent to a radiographer, who found a slight rarefied area at or near the apex of a tooth which had been perfectly comfortable for many years. The lady was told she must have the tooth removed, and loath to do so came to me for an opinion. I objected to its removal. She consulted an orthopedic surgeon and he told her she had fallen arches. A pair of shoes properly constructed effected a cure and she still has the tooth and rejoices that she did not part with it.

I am heartily in accord with the medical man who leaves no stone unturned in his desire to get at the bottom of any or all obscure causes of infection, but I am unalterably opposed to the practice which some men of the medical profession have of ordering their patients to have teeth extracted without first referring them to the dentist for his opinion.

I am also opposed to the practice which many radiographers have of giving an opinion of their own in regard to the condition of the teeth and surrounding parts. It seems to me they are transcending the limits of their authority when they advise patients to have their teeth removed. The dentist is supposed to know more about diseased teeth than the radiographer, unless he be a dentist, and even then a courteous and ethical thing for him to do is to refer the patient to his or her own dentist.

As Dr. Johnson has suggested, the radiographer may read into a case the most alarming terms which the patient does not understand the meaning of but concludes that they must be something most dangerous. Would it not be courteous on the part of the radiographer to make the picture and send it to the dentist to read without any comment?

Would it not be more ethical for the medical practitioner to

confer with the dentist upon each case where teeth are suspected as being the cause of infection rather than advise the patients to have their teeth extracted?

I do believe that many teeth are retained in the mouth that should be removed and I also believe that many teeth are removed that are in no way responsible for the troubles which they are accused of causing. One of Philadelphia's most eminent medical practitioners said to me within a year, "It is my belief that thousands of teeth are being lost that should be retained because of the notion that is so common among physicians that all hidden or obscure cases of illness derive from the teeth."

Dr. Henry W. Gillett—It always appeals to me as a compliment when an essayist of notable attainments like Dr. Johnson asks that my name be included among those to discuss his paper. It suggests to me that the essayist feels that the comments will be fair and devoid both of fulsome praise and carping criticism—in short that the discussion will supplement the paper in expressing the truth about the subject under consideration.

It is notable that a paper should come to us from Chicago calling for conservatism because for a long period a goodly portion of the dental profession in the East has considered Chicago the fountain head of extreme theories of dental practice. If you travel as far East as Boston, you will find the opinion still prevalent also that New York is considered badly infected with similar ideas. This opinion of Chicago standards dates back to the time when Dr. G. V. Black very wisely and with the care and forethought characteristic of the scientific mind set forth the principles of cavity preparation in logical order.

It will be more correct if we date this opinion from the time immediately following the publication of Dr. Black's work when some very earnest enthusiastic admirers of Dr. Black seized upon the principles enunciated and rushed into print with extreme and poorly balanced applications of them, and with equal lack of balance practitioners all over the country seized upon these misinterpretations as true examples of the teachings of Dr. Black—these extremists claimed to be disciples as well as interpreters of Black, they railed at all doubters, and because of their much speaking they, for a time, covered from view of

many practitioners the sane and unsurpassable work of Dr. Black. From that day on, the thoughtful men in our profession during Dr. Black's lifetime wanted to know when a novel procedure in dental practice came from the Middlewest what Dr. Black himself thought of it, and whether Dr. Johnson approved of it.

This bit of history seems to me an excellent illustration of the following question from Dr. Johnson's paper—"Many a worthy method of practice has been brought into disrepute through the extremity to which it has been forced by its enthusiasts."

As I read over the first pages of Dr. Johnson's paper, I realize that no words of mine can add to their force. I appeal to you to read them thoughtfully when they appear in print.

Let me, however, touch upon two points. In the essayist's opening sentences he notes that few of those fads have been devoid of merit, and then he cites as examples the "New Departure" creed, "Cataphoresis" and "Analgesia." Lest we swing the pendulum too far back, I pause to note that a few men *do* still get help for themselves and their patients out of cataphoresis and that others still use analgesia in conservative dentistry to the advantage of their clientele and themselves; *e. g.*, it is less than a week since Dr. C. F. Ash told me analgesia is an important part of his routine practice, and I venture to say there is not a dentist in this room who would not jump at the chance to have a sensitive cavity prepared by Dr. Ash provided Dr. Ash said it was a suitable case.

I second with all my energy Dr. Johnson's warning to beware of the fad when the next wave strikes us, but at the same time I appeal for a sense of proportion that shall lead us to dig deep for the real merit of the novel proposal, whatever it may be, and utilize that merit, and that only, if possible. I have, in the past, expressed myself emphatically concerning the alleged professional man who becomes the hireling of the manufacturer with a new fad to introduce at \$100 more or less per introduction, who takes a salary and then masquerades as a clinician in regular professional standing. Agents of this type were largely responsible for the vogue of analgesia as a fad. I think it probable

that for every analgesia outfit now serving a useful purpose there are several hundreds in the morgues of dental offices, and it seems to me probable that the methods scored by the essayist have cost the dental profession in the one field of analgesia at least \$1,000,000 for which they have received no equivalent. Let us set our faces resolutely against the continuance of improper methods in exploiting new apparatus.

If a graduate dentist chooses to become openly and avowedly an employee of a manufacturer and leaves the ranks of our profession permanently, or perhaps even temporarily, no criticism can lie against him, but the dentist who attempts to occupy both positions at one and the same time should be sent to Coventry.

Dr. Johnson is entirely right in what he has said concerning the mistakes of permitting diagnosis by radiographers without dental education to influence, much less to govern the procedure in any individual case. Radiographs are at best uncertain means of diagnosis, and for any man, be he dentist, physician or merely expert in radiography, to attempt to diagnose dental conditions from a radiograph alone, without accurate knowledge of the clinical conditions will very often mean, in the language of the essayist "ghastly mistakes." Some of these mistakes are being made very constantly in my opinion by a most excellent organization having its headquarters in this city and one of the ablest and most honorable men in the country as its president. The organization referred to aims to protect its subscribers by frequent careful diagnostic examinations. I believe it is doing a valuable service, but I know that it passes on to its subscribers diagnoses of tooth conditions that are the snap judgment of radiographers without dental knowledge and that their service in this field is sometimes harmful.

We need the radiograph constantly in dental practice, not only for diagnosis but to judge of the progress of the work, and the only chance of getting its best service is when the operator fits himself to make and interpret his own radiographs. It is my understanding that in this state any radiographer without a dental degree who attempts to make a dental diagnosis from his radiographs, infringes the dental law. I believe we should take measures to see that this feature of the law is enforced. I express

this opinion, not because of any feeling concerning the ill effects of non-enforcement which may accrue to individual dentists, but because we shall not be doing our duty by our clientele unless we do our best to protect them from incompetent and unwise radiographic interpretation.

It is essential that practitioners should fit themselves to interpret radiographs skillfully, and when any man has reached that point and is not ready to do his own radiography, he is in a position to refuse to employ any radiographer who attempts to add unsolicited diagnosis to his functions.

This will not, of course, protect our patients from snap judgment advice from physicians, who may have lost their sense of proportion on the subject. It is only by tactful and extended effort that we shall bring the over-zealous section of the medical men to see the need for caution, but if we go about it with good judgment, we shall have the help of the medical men who realize the importance to their clients of coöperation and in the end that aspect of the situation will clear up.

We need stabilizers in many directions—we are prone to go to too great extremes in our deductions without the antecedent searching investigation needful in order to arrive at well balanced conclusions. As a result, a lot of our alleged scientific work is merely scientific piffle.

I wish I felt free to extend the discussion in this direction to two factors in the root canal situation, which seem to me excellent example of announcing conclusions in advance of investigation. To do so, however, is likely to lead this discussion too far from the essayist's subject, and I conclude by again urging you to read and ponder well his statements when they are in print.

Dr. W. B. Dunning—We have been told by Dr. Johnson in his admirable paper that we need a stabilizer in dental practice, and Dr. Johnson, in his sweet unconsciousness, makes the statement without realizing the fact that in the last thirty years the profession has had a stabilizer—wise, capable and beneficent—in Dr. Johnson himself, the kindly philosopher of the dental profession!

When I was requested to discuss a paper by Dr. Johnson, I

felt honored indeed, for from my earliest days in practice, I have read his books carefully, and with the greatest admiration, as models of all that was far-sighted, logical, honorable and practical. In an average gathering such as this, it may be said, we have all awaited his judgment.

In discussing his paper, it is difficult to find anything on which to hang an argument in disagreement. I believe I agree substantially and fully with Dr. Johnson. Nevertheless it would not do for me to discuss his paper without bringing into the light some side issue, or perhaps taking a slightly different view-point. We are all different, though working towards ends held in common. When it comes to extreme differences, is it not true that we discover *means* of conduct by *extremes*? We must remember that all of us, even physicians and dentists, are human, and we must be governed somewhat by the laws of human nature. At least we are governed by the laws of human nature, whether we think we must, or not. The human organism advances through its life by the pulse-beat—the vital surge and reaction. Our opinions, based upon ever-growing but never completed knowledge, are often compared to the swing of the pendulum. The pendulum goes too far this way, or too far that way. Should we be able otherwise to progress? You remember the statement of the oculist who once admitted he had ruined a bushel basketful of eyes before he had devised a certain invaluable procedure. It was a sad and dreadful thing, and no doubt he realized that it was; but is it possible for finite man to progress without making just such mistakes? Let us hope his colleagues did not waste other bushelfuls of eyes, but that they profited by his mistakes. We have profited by the mistakes of others. If we could have seen in advance that certain things would be failures, we would not have attempted them; but often the only way to find the truth is to dig deep and to pay some penalty by the way.

Of course, we should be wise to the limit of our capacity; yet it is not wise in the highest sense to ignore new ideas. The dreamers come along and present their beautiful visions, and we must, at considerable risk, determine whether they be useful or not, whether they be applicable in daily practice or not; and the

only way to do this is to try them. This is the moment for the stabilizer: to go forward with caution and common sense.

Of course, the New Departure creed—as Dr. Johnson and Dr. Darby, having lived through that period, can state with great feeling—undoubtedly led to much wandering from the right path and much foolishness of thought; and I am thankful to hear the sturdy pioneers who talked to you tonight declare from their wide vision of years and years of experience that we are coming back to the use of that noble metal—gold foil—for the filling of teeth. However, I venture to say when we all come back to the use of the pluggers—and let me say I have never put mine away—it will be in a slightly different way. We will not handle gold exactly as we did before, and I believe a large proportion of the cavities will be filled by the inlay, and a relatively smaller number of cavities by the use of the foil. I agree with both gentlemen that nothing can be better than those two kinds of fillings. We may as well learn from our mistakes that the hard labor connected with each is necessary if we are going to benefit the patient.

In regard to focal infections, it is such an immense question and is so difficult to approach, that we lack as yet a good perspective. I remember a fine physical specimen coming into my office—a man of forty-five or forty-eight—splendidly built. He had magnificent teeth, in very fine occlusion. He showed me a series of X-ray pictures, and pointed out with considerable emphasis little ink marks that had been placed over the antrum on each side as points of suspicion. He said: “Is it correct that I must have all my teeth removed?” I examined the films and his mouth carefully, and then tested every tooth for vitality, finding a single pulpless tooth, an upper lateral. The root canal was not completely filled, and it was in a somewhat suspicious condition—not such that would be difficult of remedy. The health of all the other teeth was unquestionable, and his gums were in good condition. When I told him that I thought that the pulpless tooth could be taken care of, and nothing else in his mouth indicated any trouble, it was evident that his estimate of my professional standing fell instantly. He had become so obsessed with the notion that the secret cause of his systemic

trouble had at last been discovered in his teeth, that he was not willing to be assured to the contrary, although he admitted that he was not anxious to part with his splendid dental equipment. He went his way, and perhaps had his way, for all I know; but there was a clear case of harmful or ruinous misjudgment, based on insufficient data, to which Dr. Johnson refers.

On the other hand, Dr. Darby states—and he stated it twice this evening—that if he knew he had a diseased tooth in his head—one which might be a menace, and he did not deny the possibility of such a thing—if he were doubtful about the ability of anyone to make it secure against any further possibility of trouble—he would have it extracted. That is admitting that any so-called “dead tooth” with periapical trouble is perhaps a menace. I think one reason why the physician has become so exceedingly cautious and careful about finding out about the teeth is this: you have only one appendix and other similar sources of infection are comparatively limited; but when it comes to your mouth, you have thirty-two teeth, any one of which may be a source of disease, so there are thirty-two chances to be considered. It is our duty to determine whether or not there is any dental abnormality which may be a factor in the case, and if so, whether it can be reduced to safety by correct treatment, or whether the tooth must be removed.

With regard to the roentgenologist I entirely agree that he should not advise the patient, or even state to the patient his findings—that his report as an expert so far as his particular specialty is concerned, should be made to the practitioner. There is one point to make in regard to that. I think Dr. Gillett is entirely correct in stating that the practitioner himself should take his own pictures—it is so simple now to do it—and in so doing the practitioner will take pictures with some discrimination, closely related to his other means of diagnosis.

Byron C. Darling, M. D.—I wish to express, at the outset, my appreciation of the conscientious attitude which I believe the dental profession takes in regard to its work. At the same time I believe you will allow that the medical profession takes its work in a like conscientious manner.

I want to express my sense of professional deference in

particular to Dr. Johnson and Dr. Darby. Comparatively speaking I am new to the dental profession. Of course, I have no dental degree.

As we grow older, we get experiences that give us sympathy and understanding with events of the past. As I sat listening to these gentlemen, there came before me the picture of Daniel in the lions' den. However, as I remember, the lions were very kind to Daniel; and I hope you will be as kind to me tonight.

Dr. Johnson presented his paper very skillfully. I am entirely unfamiliar with the first two subjects mentioned, so I will not say anything about them.

In regard to the roentgenologist and the X-ray interpretation, I believe dentist and physician and roentgenologist must co-operate. The patient is seen by the medical man, from the medical point of view. Someone must preside over the matter. The patient is made up of teeth, of tonsils, of accessory sinuses, of digestive tract, of urinary tract, and there must be some central man who will see the patient from all these points of view. His province is to clear up all those different possible causes of disease. Thirty-two chances are in the mouth, as has been said. The dentist knows the value of the X-ray examination. He probably gets many pictures of the teeth that perhaps are not necessary, but many mouths that look to me to be perfectly healthy and where I would feel the work is unnecessary, finally present pyorrhea pockets. Who objects to making an examination thorough?

I recognize there are two theories about pyorrhea; but my theory about pyorrhea is that one infected spot spreads to the whole barrel of apples.

Now as regards the other phase of the question, the X-ray examination shows the periapical abscesses, and perhaps Dr. Hunter was not as familiar with the number to be found, as with the shell crown irritation and pyorrhea he saw in examining his patients' mouths.

As to the diagnosis the X-ray examination is the only means of showing whether there was past or present periapical disease. Clinical inspection of a dead tooth I understand adds no new light. It is the X-ray examination you rest on. If you can get

good films, and you have perfected yourself in interpretation, you are good judges, but not otherwise. He is your patient and here you are the one held responsible for his health and even for his very life itself. The roentgenologist should not present his report verbally or in writing direct to the patient, any more than I would present my report of a bone abscess or a duodenal ulcer or any other medical condition. The physician in charge is responsible for that large task of informing the patient what the trouble is and carrying out the treatment.

I believe you cannot say that the size of the destruction has anything to do with the virulency. A little line of pericementitis this year may be very definite and a very severe infection next year, and the possible cause of a long list of diseases.

Dr. Hunter of London did not start this, it was Dr. Benjamin Rush, in 1805, in Philadelphia. He wrote in his little books on various subjects, that after he extracted diseased teeth in a certain case the woman's hip got better.

Mayo, Rosenow, Billings, Daland and Haskins are some of the medical profession who have written on this subject. Dr. Mayo said this was a serious condition, and asked, "will the dentist be equal to the situation?" I know you do want to be equal to the situation but it is necessary to emphasize that from the present light of bacteriology and pathology and the present view of the focus of infection, the focus must be surgically removed. There are all kinds of root canal treatment. I know how unacceptable this may seem to some of you, but we must talk from the courage of our convictions. All kinds of root canal treatment are being undertaken, and there is no definite treatment established. Whether it will be ionization, medication or drainage, or not—it is all in a state of flux. Some of your best men attack this thing in a way that cannot be ignored; such recognized investigators as Black, Hartzell, Price, H. S. Dunning, Vaughan, Moorehead, Movitsky, Grieves, Berger, Thomas, Schamberg and others. When I go to sum up the evidence, I must take the weight of the testimony of the witnesses. As I sum it up, you are only justified now in treating this as a surgical condition, by root amputation or extraction.

The burden of proof, I believe, is on any one who leaves

this possible source of infection in the mouth. One must be able to read these X-ray films. I do not say you cannot learn, for I believe you can. You are largely interested, and you should learn, if only to see if what the other man says is correct.

I believe you will be exploited by the manufacturer of X-ray apparatus, if you do not look out. You will spend more money perhaps on X-ray apparatus than on any other equipment. When you have it, you only have a means of diagnosis and is it reasonable to expect that you can buy a machine on the salesman's talk one day and perfect yourself in technic and interpretation to do good diagnostic work the next day or the next month even if you are able to command a fee on the prestige you have established by your regular dental work?

Roentgenology is a specialty not to be lightly regarded or commercialized. The roentgenologist can be used more and more as a specialist or expert who renders a survey of certain tissue changes due to disease. He ought to render unbiased, disinterested, expert reports. These have many uses and will protect the patient, the dentist and the physician and it may be shortsighted to be amateurish in this delicate matter. I believe the best position you can be in for your diagnostic survey work, even if you specialize in root canal work; considering the matter from the medical point of view, your own professional integrity, and financial point of view, and last but not least the conservation of the patient's money and health, is consultation with the medical roentgenologist or dental roentgenologist if you prefer. It should not be with the commercial laboratory. This question of the commercial laboratory must be considered and if possible eliminated by concerted action by dental and medical societies for the good of the public and the profession.

As I have said, the roentgenologist should *not* make his report to the patient. He should act as a consultant, and give his report as a consultant. Coöperation and consultation between the medical profession and the dental profession is necessary to render the proper service to the patient. The present attitude we seem drifting toward is not constructive.

Dr. M. L. Rhein—I cannot let this opportunity go by without giving my general concurrence to almost everything that Dr.

Johnson has said; and yet I feel that we both interpret the same things somewhat differently. As Dr. Darling has just left the platform, it may not be inappropriate to add a word to that side of the question.

I want to make a statement perhaps a thousand times stronger than has been said, against the medical roentgenologist who takes dental pictures. There is no field in medicine or dentistry for a dental roentgenologist, in my opinion, and I cannot say that too emphatically. The harm they have done has not been sufficiently emphasized by Dr. Johnson—and I do not exclude Dr. Darling. I do not consider Dr. Darling proficient enough in dental histology and pathology to be capable of entering into a consultation on this subject, and to give an opinion that is of any value.

There is a field for the roentgenologist, but it is in the line that is difficult for the medical practitioner to take pictures. The simplicity with which dental pictures can be taken, added to the fact that only the careful microscopical study of dental pictures, in addition to clinical examination and diagnosis from experience, enables any man to have any idea of the true value of a dental picture, makes it almost criminal for a man who is not a dentist to dare to give an opinion on a dental picture.

As to the experiences related by Professor Johnson and Professor Darby, I could stand here and relate a long line of cases with diametrically opposite results, where these opinions gave a clean bill of health, yet which eventuated in the speedy death of the individual, or of cases where someone else intervened to the benefit of the patient.

I thoroughly agree with the stabilizing idea. I realize the terrific damage done by the incompetent man, who does not know how to interpret a picture, to say nothing of pictures that are not pictures. One of the most unfortunate things we have to deal with in this subject, is a picture that just shows a root in the alveolar structure, but is absolutely lacking in any detail of a microscopic character as it should be presented. I have seen clean bills of health given to a patient who was in the most dire condition. What does this mean? It means the medical man has failed to be educated in the histology and pathology of the

dental tissue. Unfortunately, we must come back to the weak point of dentistry, and that is, that the dentist presumes to handle a part of the human body where the circulation is not cut off from the rest of the body: the same circulation that nourishes the alveolar structure, the pulp and the cementum, is the same circulation that goes to the heart, to the appendix, to the liver and every joint in the body; and the dentist without medical education is incapable, in my opinion, of understanding the body as a whole. It may not be pleasant to say these things in this abrupt manner, but that is the paradoxical condition the community is placed in. The people lack proper service from the medical man because he does not understand the mouth, and the dentist is in an unfortunate position because he does not understand the relationship of the diseases of the rest of the system to the mouth.

There is only one way of making a proper diagnosis, and that is by taking up each part of the body in turn, and giving it either a clean bill of health, or not. When you have done that, Professor Johnson, and you have been able to give a clean bill of health to everything but the teeth and the tonsils, you have come down pretty close to the culprit. I say these two, because it is unusual to find one infection that is a focal infection of these parts, where both are not involved.

I want to say there is a general misunderstanding about what is meant by focal infection. An infection is a circumscribed area of the body where pathogenic bacteria have attacked the tissue. Since we have had the use of the X-ray and added to it the value of our bacteriologic laboratory, we have isolated a form of infection that has *no drainage*; and that is a focal infection. A focal infection may cease to become a focal infection when it has drainage that gives an external exit to those toxins. It is difficult to imagine a focal infection in the jaw, or in the crypts of the tonsils with any other pathogenic microörganism than an attenuated organism such as we find in the streptococcus viridans—where there is no irritation and no inflammation and no suppuration; but where the toxins that result from such infection are forced mechanically into the circulation, because they have no exit. Drainage is nature's physician—nature's endeavor to pre-

vent the poisoning of the patient, because—say what you will of the baneful effect of pyorrheal conditions, and I do not deny they are debilitating and injurious—they are mild compared with the toxemias that result from focal infections. It is timely to draw the line clearly as to what is meant by a focal infection, one without drainage in contradistinction to an infection where drainage is taking place.

Dr. M. I. Schamberg—Lest my discussion of Dr. Johnson's paper should be misinterpreted by him, and Dr. Darby, as antagonistic to them, I should like to preface what I have to say upon the subject by stating that we should all rejoice in having this occasion to hear our dear old teachers in dentistry, even though they do sound a note of warning, encouraging conservatism against jumping at things that are new and possibly extreme. I cannot help but feel that oftentimes if the son were to take the father's advice, he would more often be better off by not going to extremes; but we must remember that the world progresses only through the adoption of new things, and whilst Dr. Johnson has referred to several in dentistry that have been taken up too vigorously and hastily, he selected mainly those which were probably overestimated in the beginning, and not those which have been adopted and found to be of tremendous value in the advance of dentistry.

With that thought in mind I rise to talk, mainly upon the subject of focal infection, and to take odds with Dr. Johnson in his views. I believe that if some of the automobile concerns in this country were to continue to manufacture 1915 models, we would all select only those that have adopted the various improvements with which we are all familiar; to the same degree the public will object to dentists who practise nineteenth century methods in the twentieth century. I place Dr. Johnson and Dr. Darby in the twentieth century class, for they are very much like some of the old automobile establishments who have adopted the new and advanced methods, but who are at slight variance with some of the others in their line as to the importance and value of some of the improvements.

Now as to focal infection, I do not believe there is anything that is more clearly established in medicine than the germ

theory of disease. Anyone who fails fully to realize what dentistry has done in getting to the bottom of many of the devastating diseases of mankind is not familiar with his subject.

There is no reason why the medical profession should be credited with exploiting the data in connection with the close relationship between focal infection of the mouth and systemic disease. Long before I ever knew that such a wonderful man as Hunter existed, I was harping on the subject, and so were other men in dentistry—that systemic diseases frequently arose from mouth infection; but our views were only accepted by medical and dental men after certain medical authorities impressed upon them the importance of this theory. There will be many mistakes in judgment made by medical and dental practitioners in studying their cases; yet because some men misinterpret radiographs, and some jump at conclusions, it would be wrong to condemn the theory and claim that it is false.

I know of no patients who have been sent to hospitals as the result of an insufficient number of teeth. Our hospitals are filled with patients that are there because infected teeth had been retained that should have been removed. The extraction of teeth is a surgical or radical step and is subject to the same criticism heaped upon surgeons for performing operations that are considered by some to be unnecessary; but it must be remembered that surgical steps are usually followed by definite results, and that is what we are seeking in this work; that is the reason why the medical profession today call for the extraction of infected teeth as the definite means of eliminating this factor in their patients who are suffering from focal infection.

I do not say that it is right to jump at conclusions in the selection of teeth to be removed, for I realize that many teeth could and are being saved with safety to the host, but radical procedures are necessary in extreme cases. I fear that there has not been sufficient coöperation between the dentist and the medical man in arriving at a decision as to which teeth should be saved or removed. In speaking to both dental and medical men, I am often surprised at the question that they put: "Did you find pus at the end of the tooth?" The very worst cases of focal infection have arisen from areas where there has been no

pus. Only where we find a mixed infection do we get an appreciable discharge of pus, and in these cases the streptococcus viridans and hemolyticus are either absent altogether or found in very small numbers. The virulence of these organisms appears to be greatest where there is no mixed infection and where there is total absence of pus.

The unfamiliarity with many of these important points is responsible for the misunderstandings between two professions. A more scientific study of the subject will cause a happy medium to be found so that the medical man will not say: "Have all the teeth out," and the stabilizing influence will be the hearty coöperation between the two professions.

In conclusion, I want to say that the much worn crown in the mouths of patients is another thing that has caused great harm, and the only reason the dental profession hates to give it up is because it has been used so long. For the same reason the royal heads of Europe hate to give up their crowns; but it is bound to come. When the pendulum has swung too far in one direction, it usually goes equally far in the other; that is the reason some of the foreign countries got into difficulties—they went a little too far, and they now realize it.

We went too far in permitting infections to remain in the mouth. I hope while you may benefit by the advice that our revered teacher, Dr. Johnson, and our beloved friend, Dr. Darby, give as to not jumping at everything that is new, you will remember that this is one of the new things that has come to stay, and the subject of focal infection is deserving of your most earnest and scientific consideration.

Dr. W. A. Spring—Dr. Johnson has urged upon us the necessity of a stabilizer, and it seems to me the pith of the argument as it applies to us tonight concerns the subject of focal infections.

To my mind the stabilizer we need is more knowledge. I claim it to be the privilege and duty of every dentist to know more about these pulpless teeth than any physician, and that they should have final decision as to extraction.

I have extracted many pulpless teeth in my work in the Presbyterian Hospital, teeth suspected to be a menace to the

system, and have had cultures made in the bacteriological laboratory of the material directly at the apex of the root. Of all the cases thus examined I can only record one which did not have the streptococcus viridans. In all these cases the root canals were not filled.

I would like to ask Dr. Johnson what the practical application of his paper to each of us would be. There are two divisions among dentists today. A good many of the younger men and some of the older ones have become convinced that it is necessary to put in an X-ray machine and take pictures of all root canal work, sometimes many of one tooth, and raise our ideal of a canal filling high above what it used to be. We feel we must know if a canal is filled to the end, and if not regard it as a menace.

On the other hand there are men who look back on a period of years of canal treatment which they consider successful because they have not had trouble, and these men think the X-ray for regular use is quite unnecessary.

I have had opportunity to examine with X-rays some of the canal work I did before I got my machine, and have been astonished to find how many canals had been improperly filled, and I would like to ask Dr. Johnson if he thinks that we of the X-ray machines are going too far.

I am sure we will agree that too many teeth have been extracted on account of the recommendation of the medical profession where they were not the cause of the trouble, because they have failed to discover the cause in some other region.

Dr. Johnson (in closing)—I am profoundly grateful to this audience, and to the speakers, for the reception accorded me this evening. I will make one suggestion to the speakers, and it is done in the kindest spirit; I have heard the term "dead tooth." If a tooth is dead, it does not remain in the mouth—nature will not leave it there. A pulpless tooth is not a dead tooth. The reason I emphasize it is because the medical profession got hold of that term "dead tooth" and I am not sure how much that had to do with their condemnation of pulpless teeth. There have been many pulpless teeth which have remained in the mouth for many years without harm to the patient, but

with benefit. It is our loose nomenclature that has gotten us into trouble, and I hope it will be revised.

I did not come here to hamper progress, or to put a brake on any advance. I did not come here to minimize the question of focal infection—it is a very serious question—and if we have infection in the mouth, it should be removed. I want to go on record as making that statement, but the thing I object to is that we are ordered in many cases by the medical profession to take teeth out of the mouth where there is no infection—merely on the assumption of the radiographer who has said there is infection.

I did not come here to criticise the radiographer. I really felt sorry for Dr. Darling when Dr. Rhein got through with him, and I felt like defending him. I am under deep obligation to the radiographer because he has shown me things I did not know, and I welcome all knowledge; but the thing I object to is a diagnosis given by the radiographer to the patient, where he uses the terms “pus-pocket,” “pyorrhea,” “infection” and all those things—creating in the mind of the patient a fear. I stand for the people—our patients—and a cruel injustice has been done to the patients by writing the diagnoses and frightening the patients. When that idea is planted in the minds of the patients, and they are told those teeth are responsible, it is difficult to get it out of their minds.

I could mention as many cases as were mentioned tonight. I do not like reciting cases in scientific discussions, but sometimes they are significant, and I can recall one especially. It was that of a lady who had a full upper artificial denture, and some lower natural teeth, the spaces being filled with bridgework. She was in a position to realize the handicap of a full artificial denture. She came to my office and said: “Doctor, must I have all my teeth out?” I asked her why. She said: “I am not feeling very well, and I went to my physician, and he sent me to the radiographer. This man tells me I must have these teeth out.” I looked at the report and read this: “abscess on the lower central incisor.” There was a bridge there, and I said: “That is a very strange thing. Don’t you remember I extracted that tooth?” The X-ray man saw that space, and called it an

abscess, and God knows he is not the only one who has done that! The lady said: "That settles it; that is graft." I had not used that harsh term—no matter what I thought. I told her to let her physician call me up. He did not do it. I did not see her for some months, and when she came in I asked her how she felt. She said: "I had to go to the hospital and have a little operation, and I was never better in my life than I am now," and she still has those lower teeth in her mouth.

I do not minimize in any degree the seriousness of focal infections in the mouth. I want those areas of infection removed as much as you do, but the complaint I make is the impression given to people, irrespective of whether they are there or not. Sometimes vacant spaces exist, and X-ray men have marked them as abscesses—and abscesses on teeth with live pulps—I have been foolish enough to open into some of them. It is because of this that I have been made serious-minded enough to bring you this message.

I have the kindest feeling toward the medical man—what would we do without him?—and I have the kindest feeling toward the radiographer—he has helped us very much; but I ask them to keep their places.

I want to confess to you that this is one of the most immature papers I have ever read. It was written under pressure, while I was on my vacation, with the expectation that I would revise it. Circumstances were such that I could not do so, and I had to bring it to you as it was. I thank you for your charity and consideration in accepting it in the spirit in which you did.

Adjournment.

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK

December 2, 1918

A regular meeting of the First District Dental Society of the State of New York was held on Monday evening, December 2nd, 1918, at the Academy of Medicine, No. 17 West 43rd Street, New York City.

The President, Dr. A. H. Merritt, occupied the chair, and called the meeting to order. The paper of the evening was read by Dr. Elmer S. Best, of Minneapolis, entitled "The Question of So-called 'Dead Teeth' When Viewed from the Standpoint of the Patient's Health."¹

Discussion of Dr. Best's Paper.

Dr. R. Ottolengui—The essayist of the evening, Dr. Best, is a distinguished student of the very vital subject in connection with which he has presented to us a disquisition replete with suggestions of an important and helpful nature, and I have been honored by being asked to open this discussion. After two careful readings of the copy of the paper supplied to me, I have concluded that it will best please the essayist, and prove of greater interest to those present, if I pass over those points with which I am in agreement and come at once to a consideration of those with which, even if not wholly in disagreement, I am not wholly in accord.

At the very outset, then, let me say that I find on the first page a brief statement which is presented with a finality which at least I consider to be questionable. Speaking of teeth which are but partly vital, due to the loss of or disease of their pulps, Dr. Best uses the following language:

"Infected pulpless teeth have a deleterious effect upon the human system; this is accepted as settled."

By whom is this accepted as settled?

Had Dr. Best written "infected teeth 'may' have a dele-

¹ See Dr. Best's paper at page 396, this issue of THE JOURNAL.

terious effect upon the human system" his position would have been more tenable. In omitting the word "may" and stating as a positive fact that infected teeth do have a deleterious effect upon the system, he affords me an opportunity to discuss this matter from a most important standpoint. When he adds "this is accepted as settled," he voices the opinions of many physicians and dentists of the radical school, and the time has arrived when the best interests of the community demand that these radicals be forced to "prove up or shut up," if you will pardon a vulgarism which however is pertinent.

Dr. Best says the matter is settled. I say it is not settled. The line of debate is thus distinctly outlined.

Nothing is settled until it becomes a fact. No opinion can be counted to be a fact until it rests upon unassailable, undisputed proof. Evidence is not sufficient. Proof must be adduced. And surely the day has arrived when the plain dentist has a right to protest against the position of the physician, who, finding his patient with a pain for which he cannot account, sends him to a radiographer who is not a dentist, and upon the report from such radiographer that certain shadows about the ends of teeth indicate that such teeth are abscessed teeth, orders the indicated teeth to be extracted because, like Dr. Best, he believes that "infected teeth have a deleterious effect upon the human system, and that this is accepted as settled."

When was this settled? and who settled it?

The great trouble with the medical and dental profession is their sheeplike proneness to follow leaders, coupled with their woeful lack of logic in forming their opinions.

In December, 1915, Dr. G. F. Logan, of Philadelphia, in a paper entitled, "Is Tartar the Cause of Pyorrhea Alveolaris? The Logical Test Applied," (see *Items of Interest*, December, 1915, p. 881) made a splendid appeal to dentists to use more logic in arriving at conclusions. The communication seems to have made less impression than it merited. I commend its careful perusal to you all. In one place he says: "Descartes lays down the maxim that 'When we wish to arrive at the truth we must doubt everything we ever believed and especially those things about which we are most certain.'" I request the radicals in

this audience to assume this frame of mind for a few moments, which, however, Dr. Logan tells us "is not always an easy matter. Our beliefs too often stick like barnacles and impede our progress toward a solution and frequently even prevent our investigating matters about which we have very little proof, but about which we do have inflexible opinions."

As I know that there are a few gentlemen present whose attitude Dr. Logan's language accurately describes, I would respectfully request their close attention to what follows in order that, if possible, their inflexible opinions may be flexed.

In order to bring the minds of all present to a status which will render them en rapport with my argument, I will ask your forgiveness if I read a portion of an editorial written in review of Dr. Logan's communication, and others dealing with this topic of the relation of oral foci of infection to systemic disease (for complete editorial see *Items of Interest*, Dec., 1915, p. 942-8):

"We are told now by a great many of our best thinkers that a blind abscess at the end of a tooth root may induce arthritis, endocarditis and even death. A few have not even been careful enough in their announcements to interpolate the word "*may*." But we shall now see that this word short as it is, is of extreme importance. For example we might erect a syllogism of this sort.

"Arthritis is caused by streptococcus viridans. Streptococcus viridans is commonly found in blind abscesses. Therefore blind abscesses cause arthritis. Or thus: Arthritis is found associated with blind abscesses. The abscessed teeth are extracted and the disease disappears. Therefore the blind abscesses caused the disease. These, and several similar syllogisms indeed are about the sum and substance of the evidence thus far offered. Syllogisms like the above, tested under the rules expounded by Dr. Logan would not stand, because his final conclusion in regard to a similar syllogism in relation to tartar as a cause of pyorrhea reads thus: 'If then we concede that pyorrhea is ever possible without the presence of tartar, then tartar is never the cause or even an element in the cause of pyorrhea.'

"Similarly one might say: 'If arthritis ever exists in the absence of a non-fistulous abscess on a tooth root, then we cannot declare that arthritis is caused by a non-fistulous root abscess.'

"But this is not sound logic, though an argument having some weight. The syllogisms used, though accurately expressing many of the claims that have thus far been made and used as a basis for the argument that tooth abscesses have been the direct causal factors in arthritis, endocar-

ditis and other lesions, are not fair statements of the true conditions. The following syllogism is perhaps better.

"Arthritis is of bacterial origin and bacteria enter the system through a local port. The mouth is a local port, and the apices of teeth are often the propagating foci of bacterial infection. Therefore an arthritis may be a sequential result of an abscess at the end of a root."

"The word 'may' it is seen here assumes great importance. Dr. Logan interjected the word 'always' (tartar is always the cause of pyorrhea) and the postulate falls under logical rule. But if we say 'may' the postulate of systemic infection from root abscesses, not only does not fail, but on the contrary we are forced to further research and further argument before we arrive at the truth. Thus, the last syllogism declares that in arthritis (and this is even more clearly seen in endocarditis), 'the bacteria enter the system through a local port.' Let us then say, 'the mouth is a local port, therefore the bacteria may enter through the mouth.' But this is only the first link in the chain. The second link compels us to find a local sore or focus of infection within or adjacent to the mouth. We have besides tooth roots, likewise the crypts of the tonsils, and it is noteworthy that the tonsils were accused of being causal factors in rheumatisms long before the roots of teeth were even suspected. Suppose then that both tonsils and teeth are found infected coincidentally with the existence of an arthritis, which shall we blame?

"The writer is not denying that non fistulous abscesses may cause arthritis, endocarditis and other important systemic lesions. He thinks they may, but he is pleading for more logical proof, so that in future we may definitely determine when the systemic disturbance originates in the mouth, and when it does not."

Note that this plea for more logical proof of the relation between mouth infection and systemic disease was published in December, 1915. Since then bacteriological investigations have gone forward; deductions have been made, and many, with Dr. Best, believe that the matter has been settled. Hence the loss of many teeth by many patients. But has any more logical proof been presented?

To test this, a letter of inquiry was sent to a number of those accounted to be authorities, and their replies were published as a symposium as recently as October, 1918 (see *Dental Items of Interest*, Oct., 1918, p. 763-70).

One query to the men addressed read as follows: "Do you believe that such diseases as arthritis, heart disease, etc., can be caused by infections at the ends of tooth roots? If so will you

state just what you consider to be the absolute truth of this theory? "

At this point let me call attention to the language: They were asked for absolute proof; without absolute proof nothing can become a fact; nothing can be "settled." If absolute proof of any fact exists, all witnesses would present the same reasons for believing in the fact. Let me quote the reasons advanced by these gentlemen, all of whom believe in this theory.

Dr. F. B. Moorehead, Dean of the University of Illinois, presents it thus:

"There is no more definite means of demonstrating the cause and effect of infection than through the process of Koch's postulates. Rosenow has made such a complete demonstration of the production of chronic infections in animals from organisms obtained from the human, recovering the organism again from the lesions in the animal, that there scarcely seems to be any room open for argument. The fact that one may take a culture from a tonsil or chronic alveolar abscess in a patient suffering from general arthritis and inoculate a guinea pig or rabbit or dog and produce an arthritis in that animal is an unanswerable argument. While on the other hand, the fact that one may take a similar culture and not produce an arthritis does not necessarily prove anything."

Dr. Moorehead tells us that he has presented an unanswerable argument. But has he done so? In this same symposium Dr. Julio Endelman, a profound thinker and a teacher in the dental school in Los Angeles, uses the following language:

"The fact that the microörganism is found in an organic lesion, or muscular lesion, or joint lesion, or heart lesion, or kidney lesion, and that the same type of organism is found in the focus of infection in the mouth is no convincing proof to me that the original oral lesion is the source of the systemic involvement. The mere finding of the organism does not establish convincingly, in my conception, the relation between the focal infection and the systemic involvement."

Thus we note that Dr. Moorehead's unanswerable argument at least was questioned even before he wrote, since Dr. Endelman's statement was written priorily. Dr. Endelman's postulates is not exactly the same as Dr. Moorehead's, but it is quite similar.

Dr. Thomas W. Hinman writes as follows:

"My reason for such belief is that the work of Hartzell, Rosenow

and many other investigators have proved that the injection in animals of bacteria that came from cultures made from the ends of the roots of teeth or the sacs around the ends of the roots of teeth, has produced similar diseases in these animals. Then, too, in my private practice I have cleared up these apical conditions by various methods and have had arthritis and various other diseases that are caused by this infection, to clear up completely without the patient's receiving any other treatment."

Dr. Thomas W. Hartzell thus expresses his views:

"An examination of the published evidence from many other pens, save mine, amply confirms the fact that arthritis and heart disease are caused by infections from bacteria, either from tooth-root ends or pyorrhœa pockets.

"These statements have been verified by culturing from the diseased human organs and obtaining streptococcus viridans from them. These germs in turn have produced animal lesions caused by the introduction of streptococcus viridans into the blood streams of these animals. The pathologists concede these statements to be true."

Turning now to the medical world, Col. Frank Billings, U. S. A., merely asserts that he does believe that "systemic disease may occur through confined infections at the ends of the roots of teeth," but does not state his reasons for such belief beyond referring the reader to his book on the subject. It is noteworthy that Col. Billings uses the word "*may*," for which I have made a plea.

Maj. Harlow Bowles, U. S. A., professor Clinical Medicine University and Bellevue Medical College, writes as follows:

"I do believe that general infections may be inaugurated from infected foci located at the ends of the teeth. My reasons are that I have seen several instances where symptoms and signs of these infections were entirely relieved by the elimination of the primary focus. I believe that this is also substantiated by analogous pathological processes, as in infected tonsils, undrained abscesses, etc. I believe that the present tendency is, however, to overestimate the frequency with which this occurs."

Dr. William H. Park, of the Department of Health, writes the sanest communication that has appeared in print from a medical writer. He says:

"There seems to me no question that general infections follow from foci of infection in or about the teeth. Personally, I have some doubt as to whether organisms that are discharged into the mouth and swal-

lowed, do no harm after reaching the stomach. I confess, however, that this is a belief and not founded on any definite facts. In a general way, I think that teeth that have a discharging sinus are safer than an equal infection which is closed. I do not believe anyone knows what proportion of teeth gives trouble; probably a very small proportion. This lack of definite knowledge makes it extremely difficult to decide whether useful teeth should be removed except in any person having infections which are known to come from infected teeth. In any individual, the focus may have been in the tonsils or other tissues of the body, as well as in the suspected tooth."

Let us now sum up and weigh this evidence. Mainly the writers base their views upon the same so-called proof. We may quote Dr. Hartzell, as he briefly expresses just what the others have declared.

Dr. Hartzell then tells us that he has cultured streptococcus viridans from human organs, and that these germs in turn have produced animal lesions caused by the introduction of streptococcus viridans into the blood stream of the animals.

Now, gentlemen, follow closely and estimate for yourselves the value of the so-called proof here presented.

Streptococcus viridans cultured from the ends of human teeth when introduced into the blood stream of animals has produced anticipated lesions.

What deduction are we asked to adopt, based upon the above experiment? No less than that a heart lesion, let us say, may be caused from streptococcus viridans confined at the end of a tooth root.

What the experiment really proves, if it proves anything at all, is merely that the lesion produced in the animal is a result of the introduction of the streptococcus viridans into the blood stream.

No experimenter has ever introduced the streptococcus viridans into the area about the ends of the roots of the teeth of any animal and then by such means produced a heart lesion or any other systemic lesion. Moreover, all the experimenters so far as I have learned introduce the germ into the blood stream, whereas many deny that the infection alleged to be due to a focus at the end of a tooth root finds its way to the heart or other distant

organ through the blood stream, but claim rather that the via pathologica is through the lymph tracts. Truth to tell, while claiming that viridans at the root end may reach the distant systemic station, no one has as yet convincingly traced the route of travel.

Weighed in the balance of logic then the argument that infections at root ends cause distant systemic disease because cultures from such teeth introduced into the blood stream of lower animals cause similar lesions, must be set down as illogical, and the verdict must be "not proven." In this respect then Dr. Julio Endelman has good grounds for this doubting.

That these germs *may* produce distant lesions perhaps has been proven; perhaps is true. Yet even this is not final until it can be shown that the animals experimented upon are analogous physiologically with the human, and that conditions, environment, etc., are the same. But granting so much, that these germs found at root ends may produce arthritis and other lesions, it is by no means a settled question. What remains to be proven is how these germs pass from root end to heart, why they pass, and how often they do so. *Until these facts are irrefutably established no physician has the moral right to order the extraction of human teeth, and certainly not without a consultation with and the acquiescence of a competent dentist. Or better still, let us say, the physician should consult with a competent pathodontist.*

This brings us to the other arguments adduced. Drs. Hinman and Bowles report that they have seen systemic lesions clear up as a result of the removal of infections from the ends of teeth. This argument is also advanced by many others. But what does this prove? Without lengthy debate the logical deduction from the evidence is not that the extraction of diseased teeth will cure or even ameliorate systemic disease, but rather that the extraction of certain teeth, in certain cases, having produced improvement or cure, such teeth were a primal factor, or at least one of the primal factors in causing such disease.

When such extraction of suspected teeth does not result in ameliorating the condition of the patient the physician can always find some reason therefor. Hence, if the patient is cured, tooth extraction accomplished it; but if there is no improvement, un-

fortunately the extraction was too late. But note that in either case the patient loses the tooth.

It becomes highly essential then that we should not too lightly abandon our ancient dogma that the dentist's duty is to save teeth. Our manifest duty in the present grave crisis is to learn more of the actual relation of diseased teeth to systemic disease, that we may come to know when the danger to the patient is so great that one or even a number of teeth should be sacrificed and, per contra, to be able to determine when the tooth is so unlikely to be a menace that every effort at its salvation should be made. This, I think, will become the manifest realm in which the pathodontist should find his future work.²

Lengthy as this has become I cannot leave this phase of the subject without quoting from a discussion by Dr. Caroline Rosenberg of this city relating to a paper presented by Dr. Harry Goldberg at the Panama-Pacific Congress, September, 1915, because what she said then remains equally true today:

"Further investigations are necessary to understand the importance of the different microorganisms seen in both the healthy mouths and in the mouths with pyorrhea and alveolar abscess. The difference in pathogenicity of different strains of the same bacteria has not been considered sufficiently. The organism which has probably most frequently played a part in the cases to which Dr. Goldberg has referred is the green colony-forming streptococcus often called the 'streptococcus viridans.' No mouth examined has been free from them and they grow abundantly there. But the majority of them are non-pathogenic. To find the streptococcus viridans in the mouth tells nothing; but to find

²In the closing discussion Dr. Best declared that in saying that "Infected pulpless teeth have a deleterious effect upon the human system" he was not referring to metastatic disease. Courtesy to a guest who is entitled to the "last say in the discussion" prevented the writer from challenging this statement at the time. Dr. Best knows best just what he did mean, but it would be interesting if he would tell us. "Metastasis" is "the reproduction of disease at a distance from the primary seat by the conveyance of the causal agents through the blood or lymph tracts." Just what deleterious effect can infected pulpless teeth produce upon the system except through metastasis? We would all admit, for example, that an infected tooth might cause a necrosis of the alveolar bone, or an infection of the maxillary sinus, but this would only be a deleterious effect upon adjacent tissues, a spreading of infection to the surrounding locality, and cannot at all be considered as described by the words "deleterious effect upon the human system." The use of the word "system" forces upon the reader the thought that the author is conveying the idea of the transference of disease to a distance through one of the systems by which the cause of a lesion may pass from one locality of the body to another. The writer, however, had no intention to impute to Dr. Best opinions which he does not hold, yet even if he has misunderstood Dr. Best he does think that the discussion of this subject is timely if we are to save our patients from the wholesale loss of their dental organs through the dicta of medical men.—R. O.

a strain of them which is pathogenic and which will act as an antigen to the serum of the patient, producing a very positive complement fixation, as has been shown by Hastings, then a strain is found which may be, and yet may not be, one of the etiological factors in the related systemic disease. In such a case that strain may be made into an autogenous vaccine, and given to the patient, with, by some considered, good results. Vaccine made from other strains or other bacteria found in the mouth, are entirely useless and good therapeutics would discourage the injection of foreign proteids that are valueless.

"If a strain be found which, when injected into the gums of a sufficient number of test animals and the test be repeated several times, and being always properly controlled, would produce in a sufficient number of cases a pyorrhea followed by joint diseases, we would feel justified in saying that that strain of microorganism was the particular cause of the mouth and joint condition of the patient. Merely to produce an arthritis in a test animal, as the rabbit, by the injection of the streptococcus viridans taken from the mouth of a patient, would not prove in itself that it was the strain that caused the joint trouble of the patient. Many strains of the streptococcus viridans that are non-pathogenic to man will cause an arthritis in rabbits. It is thus seen what care must be taken in order not to draw a wrong conclusion from uncontrolled and limited experiments."

The essayist presents us with an elaborate system of making a mouth examination and records thereof. My opinion thereon, after studying the same, reminds me of a criticism that was once written of one of my published detective novels. The writer said: "To persons who admire this kind of a novel, this novel, we think, will be just the kind of novel that they will admire."

Hence, to dentists with a mania for recording case histories these charts will undoubtedly appeal. Personally I believe that I can treat a root canal without knowing the weight of the patient, his previous occupation or state of servitude. Jestings aside, to a student who may be intending to compile statistics from treatment of cases, these charts and this method of examination will certainly prove of advantage. To the ordinary dentist, and especially to those who cannot command large fees, it at least seems to me that the method is time consuming and costly to the patient, without adequate advantage in any but very exceptional cases.

Let us turn now to the author's technic in regard to root

canal operations, in so far at least as he has described it.

At the outset he tells us that "any decay in the tooth is carefully removed before the rubber dam is applied."

I am in some doubt as to whether the author restricts this advice to cases in which it has been already decided that root canal work will be required, or whether it is his routine.

In any case I would respectfully dissent from such procedure. In cases where we do not expect to remove a pulp, it certainly would be hazardous, as contrary to our expectations we might uncover a pulp in removing the decay. Probably no ill effects would ensue if the pulp were then immediately removed; but this is not always possible. It might be that we were only intending to remove decay and place a temporary filling, because of lack of time for a more complete operation. But even with time before us, it is not always possible to remove a pulp at a single sitting, and I am fully aware of the fact that some operators rely upon conductive or other anesthesia. I am also cognizant of the fact that some patients are not so enthusiastic about having their gums punctured with hypodermic needles as the operators are about using the needle. It is needless any way.

If the author is restricting this advice to cases where pulp removal or a canal operation had been decided upon in advance, I yet would disagree with him. Beyond removing sharp edges which would lacerate the rubber and thus make it less effectual as a dam, I would contend that a more satisfactory and more efficient removal of the decay can be effected with the dam in place and the lips, tongue and oral fluids kept out of our way.

In connection with the removal of pulps the author recommends applying formalin to the surface of the pulp, and says that "this will so toughen it that you can frequently remove it en masse." This, of course, would be desirable, and having had no experience with the method perhaps I should not even comment upon it. I do know, however, that formalin is used for hardening the emulsion on photographic films and plates. A few drops placed in a developing solution will very much reduce the chances for subsequent scratching of films. Note, however, that the film or plate is completely immersed in the formalin bath, and this induces the query as to how long a time would be required to

toughen the pulp when the application is made at one end only? If the alteration of tissue were not complete would not the toughened end be actually more apt to break away from the apical third of the pulp than where the formalin is not used? If so, the treatment would be a disadvantage rather than a help. The author's statement that after this treatment one may "frequently remove the pulp en masse" would indicate that it is not a constant result, and if not a constant result how can we be sure that the pulps removed en masse would not so come away without the formalin.

I am not here denying the efficacy of the method; I am merely giving expression to the impression made upon me by the suggestion. Our technic is complex enough as it is without adding methods that do not certainly assist us.

This matter of removing pulps en masse brings up another point which is one of the most important considerations in the entire technic of pulp removal. How is one to know that he has or has not removed a pulp en masse? In other words, how shall we determine that some part of the pulp has not been left at the apex? Such remainder will not respond painfully to instrumentation during the continuance of the anesthesia, but will be most responsive at the next sitting, and even the loss of the tooth might result if immediate root filling were practiced, as recommended by the author. Of course the author intends that all pulp tissue should be removed first, but this only brings us back to the query, how may we determine that the pulp really has been removed en masse.

For one entire winter I kept a microscope set up in my office and the apical ends of all removed pulps were immediately examined with the microscope. It soon developed that neither microscopic nor macroscopic examination of freshly removed pulps discloses whether or not the pulp has been removed entire. And this is only what was to have been expected, if one but considers the facts. We are dealing with a pulp of unknown length. We tear it away from its attachment. Where will this tear occur? Is it even plausible that the separation will always occur at the external orifice of the canal? Is it not highly probable that in many instances the parting will leave a stump of pulp within the canal?

Those of you who have seen root canals highly sensitive at the apical extremity for days, yes and for weeks, after pulp removal, will I am sure agree with me that this operation of pulp resection should be made positively complete, and that the completion should occur during the anesthetic stage. Who would think of finishing the amputation of a man's leg after his recovery from the ether?

The author will perhaps think that I am making too much of this, and he undoubtedly makes sure of his complete pulp removal prior to canal filling. On the other hand I think he has said too little of it, and I would remind him that he has not told us how he determines that he actually has removed the pulp en masse.

Moreover, he mentions the use of the apex proach in canals too fine for entrance with regular barbed broaches, but says nothing of the use of the apex broach at all apices; by which I mean at all apices where it is possible to make entrance.

The technic which I have found most satisfactory is as follows: After removal of the main portion of the pulp tissue, use a new (emphasis on the word new), a new apex broach and pass it to the apex to remove the stump of the pulp. Just take it for granted that there is a stump of the pulp still remaining. Indeed if the removal of the first part of the pulp tissue is followed by a copious hemorrhage, it is practically certain that some pulp tissue is still within the canal, either at the apex or along the side walls. Success in removal of further pulp tissues with the apex broach is almost immediately followed by a discontinuance of the hemorrhage. To determine this, the apex broach upon withdrawal should be cleansed by stirring in alcohol which will remove the blood and permit examination with a magnifying glass (about ten diameters of strength) to determine whether or not actual tissue has been brought away. This use of the apex broach should be repeated two or three times, or until it comes away clean.

If it should not bring away any tissue at either time of using, the operator should decide, not that no stump remains, but rather that a stump of the pulp does remain, but resists mechanical removal. There is always a doubt, and the patient should have the benefit of the doubt. Everything should be done that can be done to avoid this return with a tooth tender at the apex.

The next procedure then is somewhat similar to the course recommended by the essayist in canals too fine for even the apex broach. He tells us to "force in a fine, smooth broach and then apply a drop of acid, allowing the same to pass down the side of the broach; the broach is then stirred with a sweeping motion, the acid softening the dentinal wall and enlarging the canal." That acid will soften dentin and enlarge a canal is not to be disputed. I tried it once out of the mouth. I had a long rooted tooth sent to me by a confrere, and I was "dared" to fill it to the end. One canal was very fine, a broach passing about half its length. We tried this sulphuric acid method, and finally succeeded. My assistant worked at it whenever there was nothing especially urgent, and at the end of a month or two brought me the tooth with a broach passing out at the foramen. Hence I know that canals may be cleansed in this manner; only it has been a bit slow in my hands.

Returning then to the apex of the tooth about which we are in doubt, after assuring myself that I have removed all tissue that can be mechanically removed, the canal is swabbed out with peroxide of hydrogen containing bichloride of mercury, in the proportion of 1 to 500, Dr. Rhein's solution. The canal is then dried, first with paper cones and then hot air. Next sodium and potassium is used. The object of drying the canal is to assure the passage of the sodium potassium unchanged to the end of the root. In this manner any tissue that may have been left there after instrumentation is completely destroyed chemically and may be removed by subsequent swabbing. In like manner one may remove pulp tissue from canals too fine for barbed broaches.

To accentuate this danger of leaving pulp tissue at the terminals of canals let me relate a clinical experience. At a clinic in Los Angeles I was demonstrating pulp removal by pressure anesthesia and successfully brought away a pulp from a lower cuspid. It will be incredible I know, but by actual measurement that pulp after removal was more than half an inch in length. It was so long that I remarked to those about the chair: "It seems certain that we have all of that pulp, but let us follow our regular rule and see if we can get any more with the apex broach." I then used the apex broach and was as much astonished as the on-

lookers to bring away a very considerable portion of pulp tissue; so much indeed that it was easily visible even to those farthest from the chair.

I trust the essayist and those present will pardon my having treated this subject at such length, but I do believe that this technic will save practitioners and patients from many a sore tooth.

Another recommendation on the part of the essayist I must disagree with. After pulp removal he tells us:

"If the canals are sufficiently opened and you have no hemorrhage and have time to do so, complete your operation at that time."

There are others, also prominent men whose opinions, like that of Dr. Best, must carry considerable weight, who recommend immediate root filling. One of these, Dr. Kells, admits in a recent communication, however, that in a few cases he has been obliged to apply a leech to relieve after trouble. I have recently had a case in which had I practiced immediate root filling I certainly would have been forced to resort to a leech or else to the forceps, and I am confident that the patient would have chosen the latter.

In this case I placed a large gold inlay dangerously close to a pulp. Being in doubt as to the wisdom of this course I had the inlay so made that it could be easily punctured and access gained to the pulp chamber. On the third day the tooth was giving trouble and pulp removal was decided on. The tooth was entered and pulp tissue removed from four canals, the tooth being a mandibular first molar. There was nothing unusual about the operation and practically no hemorrhage. Being assured that the canals were clean, diagnostic wires were placed, the tooth radiographed and then dry cones placed in the canals and the cavity sealed with gutta percha. Two days later patient called me up at night complaining of a toothache. I had him go to my office, remove the gutta percha and the paper cones, and immediately from one of the distal canals a copious discharge of blood followed. Without exaggeration I may state that almost, if not quite a teaspoonful of blood discharged. I had the molar, both bicuspids and the cuspid passing through the rubber dam and all four teeth were completely covered with the blood.

Immediate root filling would have caused the loss of that

tooth, unless relief could have been obtained with a leech, which I think very doubtful. It certainly would not have been as instantaneous, as in this case all pain disappeared with the discharge of blood, and by the following morning the patient declared that he was a "New Man"—whatever that is.

This case is not exceptional. Long ago I abandoned the use of adrenalin in connection with pressure anesthesia because it caused a blood stasis at the time of operation followed by a hemorrhage. Consequently I must ask, why fill the canal at the off. But in any case there is always this danger of a secondary hemorrhage. Consequently I must ask why fill the canal at the first sitting when with present methods we can certainly safeguard the tooth till a second sitting?

After describing his methods of cleansing canals in which he finds gangrenous or putrescent pulp present, Dr. Best tells us: "With a fine canal plugger condensed into the apex a piece of gutta percha cone moistened with rosin and chloroform, sealing the foramen. Ray to see that it is in place. Now with heavy barbed broach and Kerr files remove as much of the infected dentin as possible by enlarging the canal."

I find it difficult to grasp the essayist's reasons for this procedure. I am ready to agree with his proposition to radiograph the tooth after attempting to seal the foramen, and before proceeding with further filling of the canal, but I fail to see any good reason for "removing infected dentin" after closing the apex. If infected dentin can be removed mechanically or in any other manner, it should be done prior to filling any part of the canal.

In conclusion I would say that no one more than I admire Dr. Best for the splendid work that he has done and for the good he has accomplished in pleading for more aseptic methods in root canal work.

Dr. C. W. Rubsam—It is not so important what our attitude may be toward a certain subject at any one moment, as it matters in which direction we are moving in regard to that subject. Either we are keeping abreast of the latest development regarding in-

fectured pulpless teeth or we are retrogressing in blissful ignorance of what is going on about us. Webster tells us that a conservative is one who opposes change or innovation and that a radical is one who is original, thoroughgoing and extreme in his course of action. The great mass of the profession lies between the ultra-conservatives, whom we may represent by the center of a circle and the radicals, who we may represent by the periphery of the circle. The ultra-conservatives are in a state of rest as is the center of the geometric figure just mentioned. The radicals are steadily pushing backward the border of the circle and constantly enlarging the stock of human knowledge. True, the radicals are liable to commit many and grievous errors, but without them the world would make but little progress. This applies with special force to the pioneers in aseptic root canal work.

Let us not lose sight of the fact that root canal therapy is a relatively new subject. Not until many years of careful records and research have determined its ultimate value, shall we be entitled to positive opinion. But the mere incompleteness of evidence for or against the operation in infected pulpless teeth must not be permitted to cover sins of omission in living up to the light as we know it to-day. I wish to lead up to the thought that as members of a branch of the healing art we are under a grave obligation to the community to advance with the best thought of the profession on the subject of focal infections or admit our incompetency.

When the operator who has been doing indifferent root canal work for years, suddenly essays to revolutionize this department of his practice, his problem is somewhat as follows. First, he must dissociate his mind of former standards of time values and output values. His road will be difficult at first as he must institute new methods without interrupting the flow of his work. It seems wiser for him to study carefully the technic of recognized authorities rather than to develop an individual technic of his own. After familiarizing himself with the work of these men, he will have added a well chosen theoretical knowledge to his practical work at the chair and feel qualified to pass upon the merits and disposition to be made of individual infected pulpless teeth. No objections can be raised to Dr. Best's com-

prehensive method of radiographing the entire mouth as a preparatory measure.

A further requisite of a careful technic is the possession of proper equipment for the production and maintenance of asepsis during the root canal operation. An autoclave or similar apparatus for the sterilization of instruments and dressings under steam pressure is indispensable. Finally, an operator must be prepared to check up his work bacteriologically. In this, as in radiography, he enjoys most freedom of action who is prepared to have this work done on his own premises instead of restoring constantly to a bacteriologist for his reports. The actual carrying out of this matter may seem an insurmountable difficulty to the uninitiated but it is my belief that within a few years we shall find as many offices equipped for simple bacteriological work as we find radiographic outfits to-day. When that day comes, we shall not be under the necessity of explaining away our actions when the members of the medical profession attempt to disparage our efforts at the preservation in our patients mouths of pulpless teeth for we shall be prepared as a profession to furnish scientific evidence of our fitness to judge of the value of our operation in the individual case and not resort to generalities when asked to confirm our procedures.

The taking of a culture from a root canal involves a few simple steps. First, we must have a fresh sterile tube of bouillon at the chair. The tooth is isolated under the rubber dam and washed with iodine followed by alcohol. The filling is removed with sterile burs and a flamed platinum needle passed as far into the canal as it will go. The cotton plug and neck of the test tube are flamed, the cotton removed and the platinum wire stirred about in the bouillon. The plug of cotton is returned to place and flamed. In 24 or 48 hours we may ascertain by the turbidity of the fluid whether there is a growth present or not. Sometimes it is necessary to plate out the culture on agar to establish the identity of the organisms. In this way the effectiveness of ionization can be tested for the particular canal.

I believe that by having access to bacteriologic technic, so that we may take unlimited cultures—which we are not apt to do if we must resort to a professional bacteriologist—we are

able to determine whether our particular method of ionization is of avail. I believe we should take into consideration the amount of electrolysis used and the method of using the current—whether one uses a small amount of current with large pressure, or a large amount of current with small pressure. If one acquires a correct bacteriologic technic, one is able to determine, in cases of systemic involvement, whether the infected tooth can be rendered sterile; and if it is possible to render it sterile by ionization or any other method (I do not believe ionization is the only method) we are justified in keeping that tooth for the time being; but I do not think we are justified in filling that canal. We must stop right there and seal up the mouth of the canal, put cotton in the pulp chamber, then gutta percha, and finally a hard cement, and dismiss the patient for several months. Later we must open it up, culture the cotton to see if there has been any leakage, and if there has been none, and we find a reinfection, we know it comes from the canal walls which were not sterilized at the time, although we could not get a culture there at the earlier trial.

Our essayist's method of sterilizing root canal instruments in cotton plugged test tubes in the autoclave appealed to me as highly practical, as in this manner we may have several sets ready for instant use without the trouble connected with keeping the instruments in a germicidal solution, as has been my practice heretofore.

The other problems connected with aseptic root canal work fade into insignificance compared with that of opening up badly calcified and tortuous canals. Here, if anywhere in dentistry, must we literally be able to see with the tips of our fingers. Even sodium and potassium and sulphuric acid sometimes fail to make an impression on the obstinate obstructions encountered. The last resort is actual following of the lumen of the canal with a special bur or the extraction or resection of the root, as the case may warrant. The use of a drill in a canal is hazardous at best and is to be discouraged except where other methods fail absolutely in carrying one to the apex of the root.

We are receiving disturbing contradictory reports relative to the value of ionization. My only data on this subject is that I have actually obtained sterility by this method in a fair propor-

tion of the cases in which it has been used. Where a previously infected canal has been sterilized, I consider it safer to seal it up for a few weeks with cement before placing the root canal filling and then reculturing to be certain of its continued sterility. Some canals have shown reinfection after the period mentioned, probably due to deep lying organisms which were not reached by the earlier ionization. We must not be misled by the presence of a suspicious looking fluid in the canal as sterile seepage of the bone may be present. Only the culture tube can settle the dispute.

In determining the status of infected pulpless teeth where secondary infection exists, I obtain a medical history from the patient and also from the attending physician if indicated. Then by comparison with similar cases I determine whether extraction, resection or mere sterilization and filling of the canal is warranted. If I decide to retain the tooth, the canal walls are curetted and ionization employed to establish a bacteria free state. When this is not possible after repeated trials, extraction is resorted to.

If we consent to save an infected tooth for a patient, we must impress upon that patient's mind that a joint responsibility exists. When we have done our utmost to set things right as far as that particular tooth is concerned, it behooves the patient to watch closely for the appearance of local symptoms in the future and also to watch for the slightest manifestation of those systemic symptoms which are commonly conceded to be associated with primary dental infections. It is always well to educate such a patient relative to our present knowledge of the subject. The patient's coöperation is taken for granted as his interest lies in that direction. If a particular individual is incapable of assuming this responsibility he had better be deprived of his pulpless teeth in the first instance. This division of responsibility is parallel to that existent in medicine in which both patient and physician watch for signs of recurrence of disease in such instances as tuberculosis, diabetes and kindred lesions. The periodic prophylaxis gives us the desired opportunity of keeping in touch with focal infection cases.

Dr. Best has come to us tonight with another piece of evi-

dence of the painstaking thought and work which he has devoted to this subject. Our profession is indeed fortunate in having within its ranks such men as Dr. Best, men who are willing to make great sacrifices in order to follow out their scientific instincts to their natural conclusions and then present them to the profession in logical form. I trust that we as a society shall show our appreciation of Dr. Best's coming here by carrying away with us tonight the resolution to put into actual operation some of the valuable things he has brought to our attention.

Dr. M. L. Rhein—It is impossible for me adequately to discuss Dr. Best's paper with any sense either of fairness to him or to the principles involved. I do not personally believe that the question of standardization is as easily solved as he seems to think it possible from his paper. There are a great many things that appear to me of much more importance in regard to the subject of standardization than he brought out, which it is impossible to go over in an impromptu manner. I sympathize with Dr. Best very heartily, and agree to a great extent in the conclusions he brings out, and I want in a way to anticipate what he might say to Dr. Ottolengui; for I have listened to this disquisition since 1915 about the lack of logical conclusions. In the first place, this wonderful article of Dr. Logan is anything but logical in itself. He is discussing a subject that he appears to know nothing about when he speaks in the way he does of pyorrhea. Pyorrhea alveolaris refers to a pathological condition in the pericemental region that can be divided and subdivided into so many ways, and the symptomatology of which is so varied that his conclusions are absolutely absurd.

Dr. Rubsam really answered Dr. Ottolengui when he said we are practising a science that cannot be compared to mathematics. Medicine is not an exact science, and it compares with many of the things in this world which "are not always what they seem to be."

Dr. Ottolengui, in the position he takes, proved to me that he believed exactly the opposite of what he contended for. I personally know that he believes that focal infections may produce heart lesions, appendicitis, arthritis and many other things. I

think when he said Dr. Best forgot to introduce the word "may" he said all he could legitimately say on that subject.

Now the real argument in this thing has been lost sight of, and that is the subject of immunology. It is immunology that prevents us from giving Dr. Ottolengui the kind of proof he asks for. A person may be immune to the toxins emanating from the streptococcus viridans that is located in granuloma at the end of a root, to such an extent that that person may proceed for years without any evidence of detriment to the system; and yet that immunity may be lost at any moment, as we know from clinical evidence. It is the large extent of this immunity that makes it possible for millions of people to go around without apparent detriment, notwithstanding the granulomas that exist at the end of the roots of their teeth.

We might as well ask for evidence in regard to a large number of physical incidents that take place in life, of which we cannot obtain mathematical proof. We know as a fact that people have unjustly had their lives taken because they have been found at the side of a murdered person with the dagger in their hand which committed the deed, and yet they were innocent. In a large majority of cases evidence of this kind is accepted and is taken as conclusive evidence of the guilt of the person; and so it is in this respect; we must accept corroborated circumstantial evidence, realizing always the possibilities of error.

To sum the matter up, a diagnosis of any person's condition (taking for example arthritis as the cause under discussion) necessitates going over every part of the individual's body, and then, by exclusion, we come down to the guilty field of infection. If a very careful and accurate internist has successively excluded the tonsil and everything else that could be a potential factor in the etiology of the trouble, and we have in that mouth granulomas at the ends of certain teeth which have been devitalized, it is, with our present day knowledge of the pathology of this condition, a fair presumption to say that we have now hit upon the cause of this particular arthritis, and it is unfair to Dr. Moorehead to say, if this is an arthritis of ten or twenty years' standing, because it is not cured, that it makes the diagnosis more or less absurd. The many cases in which these conditions have been cured are

to my mind a logical proof that we may have such conditions due to focal infections.

We have another means of proving it, which Dr. Ottolengui spoke of, but did not offer as a proof, and that is his quotation from Dr. Rosenberg at the Panama-Pacific Congress, where she alludes to the streptococcus complement fixation test, and which I would respectfully offer to Dr. Ottolengui in this fashion: I have in mind records of a number of patients. We make a pure culture of streptococcus from the periapical region of one of those granulomatous teeth. In making a complement fixation test, using this as an adjuvant, we get a positive plus condition, showing a marked streptococcus infection. In the removal of the granuloma that exists in that individual, the removal of the pathogenic condition, and the insulation of the ends of those roots, a word which has not been brought out tonight, and which is the only ultimate keynote of success by which to keep the tooth safely in the mouth—I have the records of a number of such cases, I say, where bacteriologic tests have shown that that plus condition has been changed into a negative.

Dr. M. LaRoche—I should like to add a word in regard to the culturing of the bacteria from the teeth. It seems to me that we have not gone quite far enough in that regard. We should make absolutely sure before we fill a root that the root and the surrounding tissues are absolutely sterile. In order to do that the mere passing of a broach or a platinum wire up the root, withdrawing it, and placing it in the culture tube is not sufficiently thorough to take in all the areas of possible infection. I have found that the most thorough way is to place in the root canal a little broth—preferably glucose broth—and leave it there for forty-eight hours, with the sterile paper point in there, then withdrawing the point, placing it in a culture tube of glucose agar, and incubating that for forty-eight hours, and in that way we would eliminate any possibility of reinfection at the end of a number of months, such as Dr. Rubsam spoke of.

Dr. Kauffer—I do not rise to discuss the paper, but only to add a few words, as the discussion has leaned towards steriliza-

tion of root canals and methods of determining that the canals are sterile. I should like to acquaint you with the value of iodoform as an index in this work.

First, Iodoform (CH I_3) when it comes in contact with pus is decomposed (the iodine is set free and has a therapeutic value, the carbon it taken up—digested by the phagocytes). Thus in direct ratio to the rapidity with which the iodoform disappears is the activity of the abscess.

If one makes a mixture of iodoform in a little cocoa butter he can very easily pass that through the canal into the apical space which has been or is at present occupied by abscessed tissue. If an X-ray is taken after this iodoform has been passed into the space beyond the apex and another X-ray taken 24 hours later one determines the amount of iodoform which has been decomposed by the quantity which will be shown relatively on the two radiographs, thus one can very readily ascertain whether there is an active abscess at or beyond the apex, or whether it has become passive, due to whatever treatment has been employed.

Care should be taken not to force any considerable quantity of the iodoform mixture into a blind abscess, as it will cause pain, especially if the abscess is active. Just what will follow by working a broach through the apex several times is usually sufficient to give a good reading.

Example. Iodoform is mixed with cocoa butter on a warm slab, the cocoa butter acting as a conveying agent, liquefies at body temperature and can be easily worked through the apex. We now make X-ray No. 1. If the iodoform is shown in the abscess beyond the apex the tooth is sealed and the patient dismissed. Twenty-four hours later X-ray No. 2 is taken. If the iodoform which showed in the apical space has been absorbed it will not be seen in this picture, therefore the abscess is still active and requires further treatment; if the iodoform is present the patient is dismissed for a week, when X-ray No. 3 is taken and compared with No. 1 and No. 2. When any of the iodoform in the tissue beyond the apex remains unabsorbed for one week or more we may be assured that the abscess is inactivated and the root ready for permanent filling.

Dr. Ottolengui—I am afraid that I have made an impression upon Dr. Best that I did not want to make. I am not in discord with Dr. Best's motive in his paper, which was a plea for the salvation of all teeth that can be saved with safety to the patient; and equally a plea for the removal of all pathological teeth which cannot be made physiological. I am entirely in accord with that, and I rather took advantage of Dr. Best in speaking at such length in regard to this question of whether one should use the word "may" or not, but I do so feelingly, because I resent the kind of "recognition" which we are receiving from medical men. Physicians are claiming that dentists may cause disease by not doing their work properly, but they are not admitting dentists to their consultations, before deciding upon the removal of these teeth. Hence, I consider the most vital thing that has been said here to-night, is that the word "may" should never be left out—that these teeth "may" cause infection, and when medical men are in doubt as to whether they are or are not causing infection, they should consult with us.

Dr. Best (in closing)—Dr. Ottolengui apparently has misunderstood the two lines in my paper to which he has taken exception. Let me repeat what I said on the subject.

"Infected pulpless teeth have a deleterious effect upon the human system; this is accepted as settled."

It seems strange that such a statement should be so vigorously challenged, and I can only account for it on the grounds that the speaker assumed that I was referring to the theory of metastasis in infection. It so happens that in this instance such was not my intention. My statement was in fact a very elementary one. Briefly, it was that diseased conditions have an injurious effect on the patient's system. I am quite sure Dr. Ottolengui misunderstood my remark.

It will, of course, be quite impossible for me to reply to all of Dr. Ottolengui's discussion, but I desire to make my attitude on the subject of pulpless teeth very plain and easily understood. I have never at any time or on any occasion ever said that all pulpless teeth should be extracted. Certainly, I have never said they should all be left in the mouth. There is a

vast difference between pulpless teeth and infected pulpless teeth. I do urge upon you most heartily, however, the great need of giving our patients a square deal when it comes to deciding this question for them and remind you of the fact that it is probably a greater mistake to leave infected teeth in place than to remove one that might have been saved. It has been said in connection with metastatic infection, "Who settled it?" After Rosenow's work in this connection I do not see how much doubt can exist at least as far as we dentists are concerned.

As to the use of the charts, we have not found that any of the information which we record it at all unnecessary. In fact, with any of it eliminated, the case record would be incomplete.

In removing the infected material from a tooth cavity, I would prefer to wash it out than to dry it and remove it with compressed air. It would be better for the operator, patient and general conditions in the operating room.

Also, I want to fill the canals as soon as possible. The longer we wait the more chance there is of getting them infected. The toughening with formalin is not a matter of great importance but just a little aid. As to soreness after immediate root canal filling; this is not any greater problem than the pain caused by overfilling at any other time. In the sealing of the apical foramina, before removing the infected dentin, it is my intention to get the foramina sealed as soon as possible in order to prevent material from the canal getting through into the apical tissue. Also, you all know that dentin can be, and in many cases is infected to a certain depth. We remove as much of that infected dentin as we can with safety.

I do not want Dr. Ottolengui to think that I accepted his remarks in any way other than that of friendly criticism, though it shows a fine spirit, indeed, to have him reassure me of his feelings in the matter.

I feel very keenly the problems some of you men have to handle in your dealings with what Dr. Ottolengui has called the radicals.

Dr. Rubsam's discussion, I am sure, was much enjoyed and admired by everybody. His ideals are very high, indeed,

and I believe it when I am told that he is an unusually brilliant operator.

Dr. Rhein says, "Standardization is not an easy thing to accomplish." It is not. It sometimes appears hopeless. But when once accomplished, it is one of the most comforting things we can have. It simplifies office routine so marvelously and assists so in preventing mistakes.

Your close attention to-night has been of such assistance to me that I wish to express to you my sincerest appreciation of your courteous coöperation.

Adjournment.

THE JOURNAL OF THE ALLIED DENTAL SOCIETIES

PUBLISHED QUARTERLY BY
THE ASSOCIATION OF THE ALLIED DENTAL SOCIETIES, INCORPORATED,
Representing

The First District Dental Society
of the State of New York

The Harvard Odontological Society

The American Academy of
Dental Science

The Boston and Tufts Dental
Alumni Association

The Metropolitan District of the
Massachusetts Dental Society

Massachusetts Dental
Society

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VOL. XIII

NEW YORK, DECEMBER, 1918

No. 4

EDITORIAL DEPARTMENT

ANNOUNCEMENT REGARDING THE FUTURE OF THIS JOURNAL

With this issue, completing the volume for 1918, THE JOURNAL OF THE ALLIED DENTAL SOCIETIES concludes its separate and independent career as a journal designed chiefly to report society

* 1st Lieut., D. R. C., U. S. A.; on active duty.

† 1st Lieut., D. C., N. G., U. S. A.; on active duty.

proceedings, and becomes part of a larger enterprise to record and publish knowledge pertaining to dental science and art.

Our JOURNAL has survived the war, in spite of the fact that nearly one-half of its Editorial Staff was called to the Colors; and it is gratifying to state that today the list of our readers is greater than ever before—scattered as they are in every quarter of the earth. We are glad to announce to those interested that our business condition is sound and sufficient for our purposes.

An opportunity for expansion has lately presented by joining forces with a new and important publication. The wisdom and practicability of merging our JOURNAL with THE JOURNAL OF DENTAL RESEARCH, which will issue its first number in March, 1919, was discussed informally by members of our Editorial Staff, who also are members of the Editorial Board of the new journal, and Professor William J. Gies of Columbia University, through whose initiative and effort the latter has been established. Following this conference, at a regular meeting of the Board of Directors held in New York City, the following resolutions were unanimously adopted:

Resolved, That the ASSOCIATION OF THE ALLIED DENTAL SOCIETIES, INCORPORATED, agrees to the proposed continuance of THE JOURNAL OF THE ALLIED DENTAL SOCIETIES in THE JOURNAL OF DENTAL RESEARCH, published in New York City; said Association to retain, however, its title to and proprietorship in the name of said JOURNAL OF THE ALLIED DENTAL SOCIETIES. The Executive Committee of the Association will determine and carry out [in behalf of the Association] details of this merger.

Resolved Further, That under its present Constitution and By-Laws, and in affiliation with THE JOURNAL OF DENTAL RESEARCH this Association continue to prosecute those purposes for which it was created, as set forth in its Certificate of Incorporation.

Resolved Further, That the Sustaining Members of this Association be invited to continue their annual contributions as Sustaining Members of THE JOURNAL OF DENTAL RESEARCH.

We subjoin¹ a statement by Professor Gies of the origin, scope and purpose of THE JOURNAL OF DENTAL RESEARCH, and

¹See p. 496.

with satisfaction and sincere pleasure we announce that our JOURNAL is to continue its spiritual existence and growth as part of that publication. With ample funds for the most exacting standards of scientific publication, and above all, a Board of Editors, sixty-seven in number, chosen from the leading investigators and students in all departments of our subject, it seems reasonable to believe that THE JOURNAL OF DENTAL RESEARCH will naturally, and at once, become the foremost publication in dental science.

THE JOURNAL OF THE ALLIED DENTAL SOCIETIES was founded in 1906, by the societies named on its cover, as a protest against supply-house dental literature, and for thirteen years it has embodied, preached and maintained the principle that the publication of dental knowledge should be managed by the profession, and not by the manufacturers and vendors of dental merchandise. It has championed the cause of professional journalism as its first reason for existence. It is especially gratifying to all concerned that THE JOURNAL OF DENTAL RESEARCH will print no advertisements, and that it will be in the strictest sense a professional magazine.

It has been arranged to continue the publication of the proceedings of the societies now comprising the Alliance on the same terms as heretofore, each member of each society to receive regularly, by virtue of his membership, one copy of THE JOURNAL OF DENTAL RESEARCH. Thus in addition to the proceedings of his own society, he will receive original material destined in all likelihood to be eagerly sought for and preserved. The regular subscription price will set a new standard for dental publications.

Subscribers who are not members of these societies, but who entered their subscriptions for THE JOURNAL OF THE ALLIED DENTAL SOCIETIES during 1918 for one year, will be supplied, at original subscription price, with such numbers of THE JOURNAL OF DENTAL RESEARCH as may be necessary to complete that year.

It is hoped that our Sustaining Members, who have so cheerfully shared in the financial support of our JOURNAL, may wish to continue to contribute and to encourage the new and larger work.

While the closing of this volume brings a touch of sadness to those who have worked together happily and earnestly for many years, the Editorial Staff welcomes this opening of the road towards a higher destiny, a broader field of usefulness, which we believe will be the province of the new JOURNAL.

WILLIAM B. DUNNING.

NOTICE TO PUBLISHERS

Publishers wishing to send books for review, or magazines for exchange, are requested to address,

THE JOURNAL OF DENTAL RESEARCH,
College of Physicians and Surgeons,
437 West 59th Street, New York City.

THE JOURNAL OF DENTAL RESEARCH

A new journal devoted to the promotion and publication of dental research, and to the correlation of published investigations in dentistry and related arts and sciences.

By WILLIAM J. GIES.

I. INTRODUCTION

Research reflects the spirit of democracy. Research is war on the autocracy of ignorance. Research is one of the growth-impulses in civilization. Without research, knowledge would not unfold, science would fail to expand, and the arts would cease to develop.

Dentistry is one of the important medical sciences and one of the most useful of the medical arts; but research in dentistry has lacked the quality, the inspiration, and the activity, that now characterize research in the biological and medical sciences in general. This relatively great deficiency in dentistry may be justly attributed, I believe, to two outstanding conditions, namely, inadequate and uninspiring scientific instruction in the education and training of dentists; and the non-existence of journals devoted primarily and effectively to the promotion of dental research. The former of these conditions is responsible for the smallness in the number of trained investigators in the biological aspects of dentistry. The latter of these conditions accounts for the lack of a continuing publication-stimulus to the most advanced achievement in original research in dentistry by the few who have been active investigators in that field.

Dentistry is without a typical research journal. Dental journalism is dominated, and the progress of dentistry is indirectly impeded, by certain journals of large circulation and wide traditional influence that are very plausible advertising periodicals issued monthly by dental supply-houses—a type of journalism that has long since been eliminated from influence and respect in all the other professions; a type that lowers the aspirations rather than elevates the aims of a group of men devoted to professional service.

I have had occasion publicly to protest against "this professionally degrading situation in dentistry,"¹ and in so doing have expressed the conviction that journals which avowedly represent a profession, but which actually are conducted for the financial benefit of supply-houses that sell goods to that profession and use these journals as their advertising vehicles, are unworthy of professional approval and undeserving of professional support. I have further expressed the feeling that such periodicals, *if dominant in acceptance and influence*, comprising collectively as they do a system of "get-the-money journalism," weaken professional self-reliance, impair professional self-respect, and narcotize professional ambition.²

I have received from many dentists, in all parts of this country and Canada, cordial expressions of earnest general approval of what I have published in criticism of dental acceptance of supply-house journalism. An outcome of this endorsement was a very prompt and practical indication of active interest in a prospective journal that would be devoted *exclusively* to the promotion of dental research, and which would be conducted in accord with the ideals of the highest prevailing type of journalism in the biological and the medical sciences. During the summer of 1917 I received ample assurance of continuing adequate financial support for such a publication. I then proceeded with plans for the establishment of a journal of dental research.

¹ Gies: *Journal of the Allied Dental Societies*, 1916, xi, p. 577; *Ibid.*, 1917, xii, p. 303.

² Unavoidable delay in the publication of this number of the JOURNAL makes it possible to add this foot-note. The *American Dentist*, in its issue of Jan. 1, '19, publishes a very significant paper on "the paternalistic spirit of dental manufacturers," by G. B. Hynson, "advertising counsellor" to various dental manufacturing companies, who is quite evidently well informed regarding current impositions on the dental profession by some dental supply-houses and their publicity agents, but who himself voices the highest standards of integrity. In this paper Hynson gives the following expert testimony, which is respectfully referred to dental editors of supply-house advertising periodicals "devoted to the interests of the profession": "The editors of dental journals . . . (permit) the advertising pages to be thrown open to practically all persons who wish to present their wares to the profession, and there is little or no censorship of matter or the form of its presentation. This is probably natural and inevitable, but, nevertheless, it has led to certain abuses which in time must become embarrassing. . . . Much of the advertising propaganda instituted by dental manufacturers is of a tone to belittle the profession (of dentistry), and tends to break down the high standards which the more thoughtful dentists are striving to maintain. . . . One manufacturer has said that the 'dental profession is the agency for selling our goods, and by proper advertising we must incline the profession to use more of our goods.' To accept this doctrine," says Hynson, with high credit to himself, "is to make the dental profession subordinate and subservient to the manufacturers, a condition *unthinkable*." Some of the reasons why the *Journal of Dental Research* will not publish advertisements are conveyed in the foregoing statement of facts.

II. ORGANIZATION OF THE BOARD OF EDITORS

The first step in the development of these plans for the *Journal of Dental Research* was the selection of dental editors. A few well-known dental investigators were asked to suggest the names of several dentists who are actively engaged in research. These in turn, with the former, were requested to suggest several others. This cumulative process was continued until about thirty dental investigators, and the editors of several *professional* journals in dentistry, had been designated. I then formally addressed to each (October, 1917) the following invitation to become a member of the editorial board of the *Journal of Dental Research*:

"There is urgent need in dentistry for a journal devoted wholeheartedly to dental research. Dentistry lacks, to its very serious detriment, a journal of the professional influence and standing of such journals, in medicine and the medical sciences, as the *Journal of Experimental Medicine*, the *American Journal of Physiology*, the *Journal of Bacteriology*, the *Journal of Biological Chemistry*. Dentistry would be advanced, and its usefulness and influence enhanced, by the publication of a journal which would aim to promote the correlation of published researches in dentistry and in the related medical and biological sciences, and which would improve the articulation of dental, medical and biological investigations. With a view to the establishment of such a journal, I have sought successfully for continuing financial support sufficient to warrant its early publication.

"It gives me very great pleasure to inform you that, with the advice, encouragement and support of colleagues and friends, the *Journal of Dental Research* has been founded, and that its publication (as a quarterly at first) will be started in March, 1918. We are inviting a small number of leading dentists, physicians and biologists, who have conducted and published results of research, to coöperate formally as associate editors in the promotion of this important undertaking. I cordially extend to you an invitation to become one of the associate editors.

"The *Journal of Dental Research* will deal exclusively with the promotion and publication of dental research, and with the correlation of allied investigations in medicine and biology. It will add to the literature of dental science without disturbing the support, or seriously encroaching on the fields, of other *professional* journals in dentistry. *It will not publish advertising matter. It will be absolutely independent of all supply-house influences.* It will be conducted in full accord with the highest ideals of strictly professional journalism devoted to the advancement of research. The price of subscription will be \$5 per volume. An endow-

ment fund will be created. All funds available, beyond the actual expense of publication, will be devoted, with the advice and consent of the associate editors, to the advancement of dental research.

" . . . You would be asked to coöperate officially in determining the policies of the journal and the admissibility of papers to its pages . . .

"I address you in this way confident that you will welcome this opportunity to co-operate effectively in an important venture in dental idealism, and to contribute materially to an assured success in the advancement of science in dentistry."

Acceptances were received from the following dentists, who constitute the representation for dentistry in the board of editors of the new journal:

M. T. Barrett, Philadelphia, Pa.
Elmer S. Best, Minneapolis, Minn.
J. F. Biddle, Pittsburgh, Pa.
T. W. Brophy, Chicago, Ill.
G. V. I. Brown, Milwaukee, Wis.
J. P. Buckley, Chicago, Ill.
H. E. S. Chayes, New York, N. Y.
Martin Dewey, Kansas City, Mo.
W. B. Dunning, New York, N. Y.
A. C. Fones, Bridgeport, Conn.
C. J. Grieves, Baltimore, Md.
T. B. Hartzell, Minneapolis, Minn.
Joseph Head, Philadelphia, Pa.
A. T. Henrici, Philadelphia, Pa.
T. P. Hinman, Atlanta, Ga.
P. R. Howe, Boston, Mass.
N. S. Jenkins, New Haven, Conn.
O. U. King, Chicago, Ill.
J. M. Levy, New York, N. Y.
J. A. Marshall, San Francisco, Cal.
A. H. Merritt, New York, N. Y.
F. B. Noyes, Chicago, Ill.
Alfred Owre, Minneapolis, Minn.
W. A. Price, Cleveland, Ohio.
M. L. Rhein, New York, N. Y.

R. H. Riethmüller, Montclair, N. J.

K. H. Thoma, Boston, Mass.

F. T. Van Woert, Brooklyn, N. Y.

J. L. Williams, New York, N. Y.

By a similar process of gradual democratic designation, leading investigators in the medical and the biological sciences were provisionally selected and addressed as follows (February, 1918):

"Despite its rapidly growing importance as a branch of general medicine, dentistry is without a journal devoted primarily to the promotion of dental research. For a number of years I have been engaged in dental research and have had special occasion to observe the need for a journal of strictly professional quality devoted to the advancement of original knowledge in this important field.

"With the support and coöperation of a number of the leading dental investigators in this country, I have lately established the *Journal of Dental Research*, to be issued initially as a quarterly, and to be devoted to original investigation in *dentistry and allied fields in other sciences*. The permanent financial support already assured makes it certain that funds sufficient to maintain the journal on a par with the best research journals will be available continuously, despite the inevitable shortage of subscriptions in the early period of the journal's history. It is proposed to make this journal equal in all respects to the best of the special journals in the medical and the biological sciences, and to devote it to *research on all subjects pertaining to the teeth and the mouth, and their relation to the body as a whole*.

"Our editorial staff will consist of a number of active dental investigators, and also leading investigators in allied medical and biological sciences.

"It gives me pleasure to invite you to become an associate editor to represent. . . .³ You would be consulted regarding the admissibility of papers pertaining to dental subjects that would be of interest to you as an. . . .⁴ Your opinion would be sought, from time to time, on various subjects pertaining to policy and such other matters of general importance as would enable you to function effectively in helping to develop and maintain the new journal.

"It is proposed to issue the first number in the latter part of March (1918). A response to this invitation at your very earliest convenience would facilitate pending arrangements in this connection. I hope you will be able to forward an acceptance."

Acceptances were received from the medical and biological

³ A particular science, such as anatomy, was named.

⁴ "Anatomist," "biochemist," or similar designation was inserted.

investigators named and grouped below, who constitute the representations for their respective medical and biological sciences, in the board of editors of the new journal:

Anatomy.—H. H. Donaldson, University of Pennsylvania.

G. S. Huntington, Columbia University.

Anthropology.—Franz Boas, Columbia University.

Bacteriology.—I. J. Kligler, Rockefeller Institute for Medical Research.

Charles Krumwiede, Jr., N. Y. University and Bellevue Hospital Medical College.

W. H. Park, Research Laboratory of the N. Y. City Board of Health.

L. F. Rettger, Yale University.

Biochemistry and Nutrition.—H. P. Armsby, Pennsylvania State College.

E. B. Forbes, Ohio Agricultural Experiment Station.

Otto Folin, Harvard University.

Casimir Funk, New York City.

E. B. Hart, Wisconsin College of Agriculture.

P. B. Hawk, Jefferson Medical College.

E. V. McCollum, Johns Hopkins University.

Lafayette B. Mendel, Yale University.

Endocrinology.—R. G. Hoskins, Northwestern University Medical School.

Evolution.—C. B. Davenport, Carnegie Station for Experimental Evolution (Cold Spring Harbor, L. I.).

Hygiene.—T. A. Storey, College of the City of New York.

Immunology.—Reuben Ottenberg, Mt. Sinai Hospital, New York City.

Medicine.—H. O. Mosenthal, Johns Hopkins University.

Neurology.—Frederick Tilney, Columbia University.

Paleontology.—W. K. Gregory, American Museum of Natural History (N. Y. City).

Pathology.—A. J. Smith, University of Pennsylvania.

H. G. Wells, University of Chicago.

Pediatrics.—L. E. La Fétra, Bellevue Hospital (N. Y. City).

O. M. Schloss, Columbia University.

Pharmacology and Therapeutics.—J. J. Abel, Johns Hopkins University.

John Auer, Rockefeller Institute for Medical Research.

R. A. Hatcher, Cornell University Medical College.

C. C. Lieb, Columbia University.

F. H. McCrudden, Robert B. Brigham Hospital (Boston).

Carl Voegtlin, U. S. Public Health Service (Washington).

Physiology.—Russell Burton-Opitz, Columbia University.

S. J. Meltzer, Rockefeller Institute for Medical Research.

Surgery.—A. V. S. Lambert, Columbia University.

John Rogers, Cornell University Medical College.

Toxicology.—John Marshall, University of Pennsylvania.

Additional selections will be made of representatives of the sciences named above and also of other allied arts and sciences. It is planned, also, to invite distinguished foreign investigators to association in the editorial board so soon as the international situation justifies action in this regard.

Exceptionally high quality is assured for this enterprise by the coöperation and guidance of the distinguished investigators named in the foregoing lists. It is a happy augury of a new day of achievement in dentistry that so many of the most eminent men in American science are glad to collaborate in the effort to promote dental research and to improve dental journalism.

The organization of the board of editors will be thoroughly democratic. The editorial board will be divided into committees representative of the leading subdivisions of dentistry and of the allied arts and sciences. Each editor will be a member of one of these committees. Copies of all papers received for publication will be submitted to the appropriate editorial committees for their votes on the question of admission of the papers to the pages of the journal, and any paper which fails to merit a majority vote of the corresponding reference committee will be rejected for publication and returned to the author.

I have not established this journal in order to intoxicate myself with the glory of a distinguished chief-editorship awarded

by me to myself. I have endeavored on former occasions to show up the humbug in dental supply-house journalism and I expect to continue that endeavor until such journalism ceases to dominate dentistry. I cheerfully resist, in this new constructive relation, any possible temptation to seek advantage or indulge in hypocrisy for myself. I shall serve in the editorial board of the new journal simply as a member of the Committee on Biochemistry, and as the executive officer or clerk of the board of editors, until my successor is appointed by my editorial associates, each of whom will be quite as much "the" editor as any one else. I shall perform these functions without salary, and will be one of those who will contribute financially (though it cannot be more than to a small degree) to the support of this effort to promote dentistry and through it to serve humanity.

III. GENERAL PLANS AND PROCEDURE

Each volume of the new journal will consist of about 500 pages. Numbers will be issued quarterly until the regularly available supply of accepted papers justifies bi-monthly or monthly issuance, when either of these two modes of publication will be adopted.

It had been intended to issue the first number of the *Journal of Dental Research* in March, 1918, but minor reasons for delay for a few weeks were soon superseded by a major reason for indefinite postponement. That reason was the remarkable series of threatening drives by the German Army toward the English Channel and toward Paris, beginning last March and continuing until July, a series of German advances which so completely carried our whole nation into the successful effort to turn the tide—and the American Army arrived in time to do it—that it was impossible to think of going forward with our journalistic plans until we should be able to go forward with plans for peace. Conditions now seem favorable for the issuance of our first quarterly number in March, 1919.

The new journal will not present any advertising matter of any kind. It will not be a supply-house dummy or a trade circular, but a strictly professional project. Its financial support will be paid subscriptions for its volumes and public-spirited

contributions to its success by individuals who find it happy to serve the public and who will accept nothing in return for that service. Plans for the establishment of an ample permanent endowment fund will be published in due time. All funds received in excess of the total sum needed to meet irreducible expenses will be devoted to the enlargement of this endowment fund, and ultimately for the promotion of research in dentistry.

The subscription price of the *Journal of Dental Research* will be identical with that of most of the other research journals of the highest type, namely, \$5.00 per volume. So soon as it will be possible to issue the new journal for less than \$5.00 per volume to the subscribers they will be told, in our public announcement of the change, just how it can be done.

It is planned to incorporate the *Journal of Dental Research*. It will be its own publisher.

Proceedings of societies, if offered, will be published in condensed form, but every effort will be made to discourage verbatim presentation of "discussions." Society proceedings, when accepted for publication, will be printed at the expense of the societies involved. The pages devoted to such proceedings will be regarded as supplementary material and will be added to the regular total (500) in making up each volume.

There will be no editorials, therefore no "editorial policy." Criticism or comment, except such as relates to research in dentistry and allied arts and sciences, unless it appears in proceedings of societies, will be excluded. The new journal will not be a dental newspaper.

Special effort will be made to interpret the gist of every contribution in the new journal in a way to enable the busy practitioner of dentistry to see at a glance the bearing of each paper on his practice. This will be accomplished through the agency of a brief statement at the head of each paper, by its author, in answer to our standing request: "*State briefly, clearly, and in simple terms, what, if any, relation your paper bears to the active practice of dentistry.*" It is believed that this plan, which certainly can be effectively executed, will render the new journal invaluable to the busy practitioner, for it will make directly available to him, in a few words (whatever may be his

state of training in dentistry and the allied arts and sciences), the *practical* aspects of every paper the new journal will publish. The *Journal of Dental Research* will be, therefore, not only an archive of original research for the student and scholar, but also a repository of brief analyses of published researches in *practical* terms for *practical* men.

Dentists everywhere are cordially invited to subscribe for the *Journal of Dental Research* and to contribute papers to its successive volumes. Readers of this statement, who may wish to aid the effort to establish a research journal in dentistry, can do so with special effectiveness not only by subscribing for the new journal, but also by passing to their uninformed colleagues the information conveyed in this summary of facts regarding the new journal.

Inquiries, subscriptions, papers for publication, remittances, and general correspondence may be addressed directly to the *Journal of Dental Research*, or to the writer, College of Physicians and Surgeons, 437 West 59th St., New York City, or to any member of the board of editors designated above.

ADDENDUM

Informal discussions, by friends of both the *Journal of the Allied Dental Societies* and the *Journal of Dental Research*, led to formal submission, to the Association of the Allied Dental Societies, Incorporated, and to the Editors of the *Journal of Dental Research*, of the general question whether the older journal might not be merged with, incorporated into, or continued in, the new one.

The Association of the Allied Dental Societies, Incorporated, the first body to act on this question, recently adopted the approving resolutions that appear on page 493 of this issue.

This question was then submitted, in an explanatory circular letter, to the entire body of editors of the *Journal of Dental Research*, in the form of a request for a vote of Yes or No on the following memorandum in this relation:

"I favor the adoption of the proposition that the *Journal of the Allied Dental Societies* be continued in the *Journal of Dental Research*, and that this *spiritual* continuance be indicated, on the title pages, by the

subordinate phrase: 'Continuing the *Journal of the Allied Dental Societies*'; provided, however, that no change of any kind in the character, or editorial control, of the *Journal of Dental Research*, as previously outlined formally to the editors, is involved in this intended compliment to the older journal."

Despite the fact that many of the editors of the *Journal of Dental Research* continue to be actively engaged in the national service and on that account are out of range of prompt communication, the following vote on this proposition has already been registered (Jan. 3-10):

Votes in support of the foregoing proposition.....	50
Votes opposed to the foregoing proposition.....	2
Blank ballots	2
Not heard from to date.....	13
	—
Total	67
Votes constituting a majority.....	34

In harmony with the concordant decisions of the two executive bodies concerned, the first and succeeding issues of the *Journal of Dental Research* will present, at the top of the outside of the front covers and on the opening pages, the following title and legend:

JOURNAL OF DENTAL RESEARCH

(Continuing the Journal of the Allied Dental Societies)

A critical examination of the enacting resolutions adopted in this relation by the Association of the Allied Dental Societies, Incorporated (see page 493), and the corresponding memorandum adopted by the Editors of the *Journal of Dental Research* (quoted above), emphasizes the following main facts in the concordance between the two executive decisions:

1. The *Journal of the Allied Dental Societies* will be absorbed into, and will continue in name and in spirit in, the *Journal of Dental Research*.

2. This *spiritual* absorption of the older journal into the new does not imply or involve any change of any kind whatever in the plans for the development, or in the character, or in the editorial conduct, of the *Journal of Dental Research* as originally

explained to, and approved by, its editors. The board of editors of the *Journal of the Allied Dental Societies* will suspend its function with the publication of this (Dec.) issue, and will not enter the editorial board of the *Journal of Dental Research*.

3. The Association of the Allied Dental Societies, Incorporated, continues its independent existence and retains its legal title to, and proprietorship in, the *name* of the *Journal of the Allied Dental Societies*, though not in the new journal itself. The Association will continue, in affiliation with the *Journal of Dental Research*, to prosecute the purposes for which the Association was created. The first of these decisions reserves to the Association its independent right to withdraw the name, "Journal of the Allied Dental Societies," from the title pages of the *Journal of Dental Research*—nothing more, so far as the new journal is concerned. The second of these decisions announces the Association's willingness to coöperate, *informally*, with the *Journal of Dental Research* in support of the professional aims and purposes of the new journal, so long (implied) as these objects are approved by, and agree with those of, the Association.

The continuance of the *Journal of the Allied Dental Societies* in the new journal implies the publication in the latter of the proceedings of societies. This implication will doubtless raise, in the minds of many, this question: *How can the Journal of Dental Research, intended to be a typical research journal, publish such proceedings without weakening or destroying the primary purpose of its establishment?* My answer to this question is that it can be done very easily, very effectively, and very much to the advantage of dentistry, without affecting the research quality of the new journal in the slightest degree, provided new and better standards of publication of such transactions are adopted, and provided also that proceedings are published as *supplementary* matter without effect on the mass of the text of the journal itself.

In my original statement above, as it was put into type before this "Addendum" was penned, I wrote, in this general relation as follows:

"Proceedings of societies, if offered, will be published in condensed form, but every effort will be made to discourage verbatim presentation

of 'discussions.' Society proceedings, when accepted for publication, will be printed at the expense of the societies involved. The pages devoted to such proceedings will be regarded as *supplementary* material and will be added to the regular total (500) in making up each volume."

It may not be widely known among dentists that such leading research journals as the *American Journal of Physiology*, the *Journal of Pharmacology and Experimental Therapeutics*, and the *Journal of Biological Chemistry*, publish the proceedings of societies. The *Journal of Dental Research* will follow their example, but in doing so it will apply, if possible, for the benefit of dentistry, the knowledge and experience that have been accumulated, in this relation, in the biological and medical sciences.

The new journal will endeavor to persuade the societies, that may offer proceedings for publication, to present statements of their proceedings (1) in clear, condensed, readable, and practical forms, by the societies' official editors, (2) after thorough elimination by them of the prolixity, repetition, and vacuity, that characterize many papers on hackneyed subjects and many redundant so-called "discussions," (3) and with the "*abstract*" method, in the third person, applied to all but apt remarks on strictly original research, or on really new or particularly pertinent professional matter. What is the use of preserving *verbatim* all the "things that are said," however trite or insignificant they may be, merely because they *are* put into words at a society meeting? Has not the time arrived to stop the unlimited distribution of words, and to give more attention, in much less space, to concentration of professional thought, in the recorded proceedings of dental societies? If the societies involved will agree to the proposed change in style, the proceedings published in the new journal will open the eyes of dentists to the possibilities of improvement in their journals in this respect and, indirectly, will bring about an elevation, besides, in the standards of scientific meetings of dental societies. The proposed change in style will have the further merit (by showing how easily proceedings can be abbreviated without omitting anything material), of revealing how little has been presented at many meetings to which entire evenings have been devoted by large bodies of busy dentists needing physical rest and professional nourishment.

Each volume of the *Journal of Dental Research* will contain about 500 pages devoted to research. Pages devoted to proceedings will be *extra* pages—they *will not take the place of papers on research*. The expense of publishing these *extra* pages of proceedings will be paid by the respective societies and will cost subscribers nothing—not even attention, if they wish to ignore the proceedings. The extra pages devoted to proceedings (except papers on *original research*, if acceptable, which will be taken from the proceedings and placed in the main body of the journal) will be assembled at the end of each issue. Further, the page numerals for the proceedings will be roman, and consecutively adjusted for each issue and each volume, so that the supplementary pages of proceedings in the numbers comprising a volume can be suitably segregated at the end of a *bound* volume, following the 500 pages of research-text that will be paged, conveniently, with arabic numerals, in each number and volume. This arrangement—main body of 500 pages of the journal regularly devoted to research and a *supplementary* portion, of variable *additional* extent, devoted to *condensed* accounts of proceedings—yields, I believe, all the advantages of, and removes all the objections to, the publication of society proceedings in a research journal.

I am very hopeful of finding that every society concerned in dignified, effective, economical, and fruitful, publication of its proceedings, will see the advantage of adopting this improved style of presentation in accord with the highest prevailing standard of professional literature in this relation.

In the circular letter to the editors of the *Journal of Dental Research*, it was said, in approval of the proposal to continue the *Journal of the Allied Dental Societies*, that I favored an affirmative vote “in order to save the spirit, and keep alive the memory and influence, of one of the most earnest endeavors to improve dental journalism”; and “to give continued bibliographic value and position to all the volumes of the journal that is about to discontinue publication.” It is a very great pleasure, and an abiding satisfaction as well, to find that the *Journal of Dental Research* is able to function effectively in this unexpectedly constructive way, and that the original purpose underlying the establishment

of the new journal had the spiritual depth and breadth to make this journalistic development not only possible, but also a natural and a desirable professional evolution in dentistry.

The issuance of the *Journal of Dental Research* is a direct and frank appeal to the unselfishness, the devotion, the valor, the power, and the dignity, of the professional spirit in dentistry. It is a "call to the colors" of the forward-looking and forward-stepping men in dentistry—a call to volunteers to go "*over the top*" to a better day for dentistry and humanity!

*Biochemical Laboratory of Columbia University,
College of Physicians and Surgeons,
New York City.*

CURRENT DENTAL LITERATURE

Compiled by Arthur H. Merritt, D.D.S.

Titles marked with an asterisk are abstracted briefly

American Journal of Syphilis, St. Louis, July, 1918.

37 New Pathology of Syphilis.

A. S. Warthin.

The statement is made that the pathologic diagnosis of syphilis is essentially microscopic. The gumma is not the typical lesion of old or latent syphilis; in fact is a relatively rare formation; the new pathology of syphilis is based on the fact that the essential lesion of latent syphilis, is an irritative, or inflammatory process usually of mild degree, due to the localization in the tissues of relatively avirulent spirochetes. Inflammation of this type occur in all tissues and organs, but are most easily recognized in the heart, aorta, nervous system, testes, suprarenals, and pancreas. Though syphilis tends toward mildness, the relationship between the host and spirochete may become such, that the virulency of the latter is greatly increased, resulting in new manifestations of the disease. The disastrous effects of syphilis usually require years for their development.

Boston Medical and Surgical Journal, September 19th, 1918.

38 Treatment of "Essential" Facial Neuralgia by Local Alcoholization.

J. A. Sicard.

The statement is made that the destruction of the nerve by means of chemical substances, especially alcohol, introduced directly, remains the only really effectual treatment of trifacial neuralgia, taking the place of surgical methods. Of the many agents used, alcohol has proved the most satisfactory, varying the strength from 70 per cent to 95 per cent according to the age and condition of the patient and should not exceed $1\frac{1}{2}$ c.c. Local anesthesia is obtained by the use of novocain. Adrenalin should not be used with it, as it seems to predispose to oedema and even necrosis. It is absolutely necessary that the needle be introduced with precision into the parts to be injected. The pain of the neurolysing injection can never be wholly prevented or overcome but can be reduced to a minimum by waiting a few minutes after the injection of the novocain. In cases of "essential facial neuralgia" by which the Author apparently means tic the results are remarkable, providing proper technic is observed. The one essential is that one makes sure of reaching the nerve branches responsible for the pain. The only cause of failure is the inability of the operator to reach the nerve trunk with his needle. The cure may be

permanent; as a rule, however, relapses occur in a year or year and a half. Sometimes these relapses are less severe than the primary condition. They are always amenable to the same operation and subsequent results are apt to be of longer duration. After the fifth or sixth injection, it is rare that the cure is not permanent.

California State Journal of Medicine, August, 1918.

39 Prevention of Congenital Syphilis by Antisyphilitic Prenatal Therapy. H. Lissner.

Lissner expresses the belief that proper treatment of acquired syphilis before pregnancy will to a considerable extent prevent premature births, so often characteristic of these cases. Intensive treatment of syphilitic mothers during pregnancy will prevent miscarriages, stillbirths, etc., in the vast majority of cases; and will insure living children at full term, who will not, in the majority of cases, develop congenital syphilis. Such treatment does not interfere with the normal course of pregnancy or labor, and should become an established routine of practice. Its adoption would do much toward preventing the great waste of life among such cases.

Dental Cosmos, September, 1918.

40 The Pathogenesis and Prophylaxis of Pyorrhea Alveolaris.

Maurice Roy.

Roy asserts that precocious senile resorption of the alveolar process is the initial lesion of pyorrhea. It is of general origin and occurs independently of local causes. It may also occur in the apical region. Disturbances of articular equilibrium, malocclusion, malposition, loss of teeth, etc., favor its development. In advanced age, alveolar resorption is a physiological process. Senility, however, may occur at an early age, and find expression in alveolar absorption; it is associated with the vitality—general nutrition of the individual. It may be said that all diatheses tend to provoke precocious senility. Arthritism, in particular, because of its accompanying circulatory disturbances, and of the vaso-motor and trophic phenomena it provokes, is quite naturally the diathetic condition which is most often the cause of precocious senile atrophy, and consequently of pyorrhea. As long as there is parallelism between alveolar and gingival resorption no pockets are produced and suppuration is absent. As a result, however, of gingival inflammation, this parallelism may be destroyed, and the bone more rapidly absorbed than is the gum, with the consequent formation of pockets. Thus two new elements of the disease are introduced: infection and calculi. Gingival inflammation is conveyed to the pericementum and alveolar process, with the result that osseous resorption of an inflammatory nature is added to senile or atrophic resorption. However large the role played by gingivitis and

disturbances of articular equilibrium in pyorrhea they are not, in the opinion of the Author, the primal causes, and will not of themselves, when dissociated with precocious senile resorption, cause pyorrhea. On the other hand, it is stated that "precocious alveolar resorption would not pass on to the mature condition marking the serious state of the disease, if one of the local adjuvant causes did not intervene," thereby admitting that pyorrhea as generally recognized, is dependent for its development and progress upon purely local causes; that however much of gingival recession there may be as a result of senile resorption, pyorrhea so-called, will not develop in the absence of local exciting causes. It would seem therefore that the role played by precocious senile resorption in pyorrhea is simply that of a predisposing cause, which in the absence of local exciting causes produces none of the complex symptoms of pyorrhea, except gingival recession. A condition such as that could hardly be called pyorrhea when dissociated with the more characteristic symptoms of gingival inflammation, pocket formation, suppuration, etc. Regarding the treatment of what the Author calls "General Causes," meaning thereby senile alveolar resorption, while admitting that it is of great importance, unfortunately gives no hint of what that treatment should be. At the same time, he states that "it is necessary to recognize that in the actual state of our knowledge, it (precocious senile resorption) can exert only a restraining and remote influence upon lesions once they have arisen," that "local treatment . . . will have the happiest effects upon the evolution of the disease, either by preventing its arrival at maturity, or by causing the disappearance of the secondary elements."

Regarding local causes, it is said that efforts should be directed "toward the elimination of all causes leading to a disturbance of articular equilibrium of the teeth, favoring precocious alveolar resorption," emphasizing under a different term the importance of correcting what in this country has been called "occlusal trauma." The importance of a high order of mouth hygiene is urged in which the patient's cooperation is essential to success, the statement being made that "*Pyorrhea pockets are formed around a tooth only when one point of the gingival neck of the tooth cannot be maintained in a satisfactory state of cleanliness.*"

Journal of the American Medical Association, September 7th, 1918.

- 41 Perforating Ulcer of the Hard Palate Resembling Tertiary Syphilis, But Due to a Fusospirillary Invasion (So Called Vincent's Angina). L. F. Barker and S. R. Miller.

After reporting a case of Vincent's Infection which came under the observation of the Authors a detailed study is made of the disease which ought to help to clear up much of the misinformation regard-

ing it, especially the belief shared by so many, that it is usually associated with syphilis. According to Vincent's original classification who between the years 1896 and 1905 published several comprehensive articles regarding the bacteriological and clinical aspects of the disease, the lesions fall into one of two groups, either of which may run its course in a few days or persist for weeks. First, the superficial, pseudomembranous form, in which a thin, greyish white film usually develops over the affected area, often spreading very considerably. As a rule the membrane is easily removed, though not *en masse*, leaving a red and bleeding base. Second, the ulcerative, and more common form, in which there is deep tissue necrosis, covered by a thick creamy, yellowish or grey exudate, easily removed, leaving a raw granular, bleeding base. These lesions may occur in many places including various portions of the mouth, bronchi, gastrointestinal tract, etc. The disease is both infectious and contagious. Smears taken directly from the lesions show a great variety of organisms, with a large predominance of the *Bacillus fusiformis* and *Spirochetes*. Both are anaerobic, and believed to be the direct cause of the disease. The order in which it is most often seen is, first, the gums, second the tonsils and third the buccal mucosa. Among the general symptoms are slight temperature, offensive breath, enlarged cervical glands, bad taste, tenderness and pain in affected area, malaise, depression, etc. There is no foundation for the belief that Vincent's disease is associated with syphilis. On the contrary, there is the best of evidence that it is not, as shown by a careful study of large numbers of cases. Treatment consists in establishing and maintaining a high order of mouth hygiene. The disease rarely occurs in clean mouths with healthy gingiva. Local applications of Fowler's solution of arsenic, 2 or 3 times daily, is advocated. Ten or fifteen drops added to the tooth brush and used in brushing the teeth and gums is also helpful. Local applications of arsphenamin in concentrated solution is regarded as the most satisfactory drug to use. The use of mercury in all forms is contra-indicated.

Note—Caution should be exercised in the use of arsphenamin because of its toxicity, due in no small measure to impurities in the drug. Of the four preparations of arsphenamin in use in this country, the one known as "arsenobenzol" is reported as being distinctly the least toxic. See "Toxicity of Preparations of Arsphenamin," *American Journal of Syphilis*, July, 1918.

Journal of the American Medical Association, September 21, 1918.

- 42 Dental Bacteriology in Relation to Dental Caries. Editorial. Reference is made to the recent work of Meyer and Kligler and the statement made that the relations of cause and effect are by no means clearly demonstrated in the bacteriologic studies of dental caries that

have been made up to date. Microorganisms, however, appear in some way to be responsible. All the families of bacteria are represented in the healthy mouth. Their number is twice as large in unclean, as in clean mouths and four times as great on teeth that have not been brushed. Oral microorganisms are as much influenced by changes in the mouth as are those which grow in the soil or in the intestinal tract. Their total number increase during the night and immediately following meals. Brushing of the teeth reduces their number about three-fourths. It is predicted that bacteriology and the dental clinic will become more closely related to each other in the immediate future.

Journal of the American Medical Association, October 5th, 1918.

- 43 Epidemic Influenza (Spanish Influenza).** Editorial.
also
Therapeutic Dept., Page 136, and Public Health Reports,
September 27th, 1918.

All writers are agreed that the causative agent in so-called Spanish Influenza is uncertain. That it is an organism there is no doubt, but it has not been proved to be the influenza bacillus of Pfeiffer, though this organism with many others is present. The usual symptoms are acute onset, pain in head, back, eyes, limbs, joints, etc., great prostration, chills, dizziness, vomiting, constipation, temperature of 100 to 104 with comparatively low pulse. Inflammation of the mucous membrane of the nose, throat and bronchi are common. Complications in the form of lobar pneumonia are not infrequent. The incubation period is short but its exact length is not known. The disease is probably spread entirely by contact infection, the most dangerous forms being coughing and sneezing. The points of egress and inoculation are the nose and throat. Uncomplicated cases usually run their course in from 5 to 7 days. Treatment is largely symptomatic. Rest in bed, cleanliness of the mouth, adequate ventilation, avoidance of exposure to cold, isolation, increased elimination by ingestion of hot drinks, etc. Acetyl-salicylic acid (aspirin) may be given in 15 grain doses every three hours for the relief of pain. Crowded and unventilated places should be avoided as far as possible.

Journal of Experimental Medicine, Baltimore, August, 1918.

- 44 Classification of Hemolytic Streptococci.**

R. A. Kinsella and H. Swift.

A study was made by the authors of 28 strains of streptococci of the hemolytic type, taken from different pathologic sources, with a view to determining their cultural characteristics, power to hemolyze red cells, and their behavior in the complement fixation reaction. Several variations in fermentative activity were noted. Also the similarity between all the strains was strikingly emphasized by the complement

fixation reactions, indicating the close identity in strain, notwithstanding the fact that they were brought together from different pathologic sources and showed many superficial variations in cultural activity. The relation between the hemolytic and non-hemolytic streptococci is orderly, arising from the fact that the former is unique while the latter is heterogeneous. This suggests that unique varieties of bacteria are the more highly invasive, while the heterogeneous varieties are more saprophytic.

Oral Hygiene, September, 1918.

45 Rheumatism and Its Relation to Diseased Mouths and Teeth.

J. D. Adams.

Adams asserts that rheumatism is fundamentally a focal infection, due to chronic foci of infection somewhere in the body. These may be in the mouth, gastro-intestinal, or respiratory tracts. The term rheumatism should be discontinued, and terms more expressive of the nature of the disease substituted, such as arthritis, neuritis, myositis, etc., depending upon the seat of the disease. Treatment consists in discovering and removing exciting foci, a liberal diet, fresh air, and the drinking of not less than two quarts of water daily. The belief that red meats, acid foods, etc., cause rheumatism, or unfavorably influence it, is a fallacy.

The Pacific Dental Gazette, June, 1918.

46. *Diagnosis. D. B. Domb.

47. *Dental Granuloma. Editorial.

46 Diagnosis.

The Author deals with the diseases of epilepsy and syphilis, and at some length with the problem of immunity which he defines as the exemption of an individual from disease, or that condition of the body by which it resists the development of morbid processes. It may be active, congenital or passive. Regarding the three stages of syphilis it is stated that the primary stage includes the time from the moment of infection to the outbreak of the general symptoms, eruptions, mucous patches, etc., lasting from eight to ten weeks, and the appearance of the spirochete, which is not usually found until three weeks after infection. At the end of three weeks chancre appears. The secondary stage begins with the appearance of the eruptions and mucous patches. It is the stage of typical and regular development of eruptions, and lasts from six to eighteen months, with an average of one year. During this stage, the glands nearest the chancre become enlarged. The tertiary stage comes on after a prolonged period of latency, and is the stage of the formation of gumma. This stage may never occur. Its secretions are not contagious, and it resembles a diathesis more than a disease. Syphilis is not liable to

be communicated to the foetus during the secondary period, and the first three or four years after the primary sore.

47 Dental Granuloma.

As a result of the Author's investigations of the pathology of these lesions, it is his belief that detachments of the pericementum do not occur as a constant accompaniment of chronic infections in the periapical tissues. The detachment or destruction of the pericementum in this location is the advanced stage in the process, and occurs only as a result of an exacerbation of the infection, or not until the granuloma breaks down, and the inflammatory cells which make up its bulk undergo process of liquefaction. A dental granuloma which shows in a roentgenogram as a dark area at the apex of the root, is not an evidence that that portion of the root is necrosed. The lesion, until such time as the infection acquires increased virulence, does not lead to tissue destruction, but to tissue proliferation in the pericementum. Not until after the degree of virulence of the organisms concerned in periapical infections changes from chronicity to a more acute form is the lesion destructive in the surrounding alveolar bone, and at the same time constructive in the pericementum, that is, tends to tissue proliferation. Because of the failure to recognize these facts, there have arisen two opposing schools of thought—the radical, which believes that all non-vital teeth should be extracted and so advise, and the conservative, who contend that many such teeth can be saved, providing a discriminating diagnosis has been made and proper treatment given.

Southern Medical Journal. July, 1918.

- 48. *Oral Sepsis and Digestive Apparatus. L. F. Barker.
- 49. Oral Sepsis and Anemias. M. L. Graves.
- 50. Diagnosis and Treatment of Oral Infections. T. P. Hinman.
- 51. Oral Sepsis and Arthritis. J. H. Gibbes.

48 Oral Sepsis and Digestive Apparatus.

The two chief causes of diseases of the digestive apparatus having their origin in oral sepsis, are chronic alveolar infections, occurring in the periapical tissues, and infections taking place at the gingival border, such as that proceeding from gingivitis, pyorrhea, impacted and partially erupted teeth, etc. The most common manifestation in the digestive apparatus are gastritis, gastro-enteritis, achylia gastrica, pylorospasm, and toxic hepatopathy. In some instances, it seems probable that gastric and duodenal ulcer are secondary to oral sepsis. Whether appendicitis and cholecystitis may occasionally be caused by oral sepsis, the Author says, is still in doubt.

NOTES ON DENTAL PRACTICE

COMPILED BY WILLIAM D. TRACY, D.D.S.

Teeth and Tonsils as Causative Factors in Arthritis.—Roland Hammond (*American Journal of the Medical Sciences*, October, 1918), thus summarizes the mooted question of the relation of the teeth and tonsils to arthritis. Billings and his followers point to the careful work of Rosenow and others on the bacteriology of arthritis and to the numerous cases of improvement and cure of arthritis following removal of diseased teeth and tonsils. They believe that this proves the accuracy of their contention that a focus of infection exists in the head in many of these cases. On the other hand, many trained pathologists and reputable clinicians have been unable to reproduce either the laboratory findings or the clinical results of the Chicago workers. Consequently they either reject the theory as a whole or accept it in a greatly modified form. It is probable that the pendulum has swung too far in the direction of the wholesale removal of teeth and tonsils. The truth will probably be found in a middle ground somewhere between these divergent theories. There is undoubted improvement in numerous cases of arthritis following the removal of an abscessed tooth or a diseased tonsil or when a case of active pyorrhea has received proper treatment. On the contrary, many such cases are given similar careful treatment without affecting the progress of the joint condition in the slightest degree. One very suggestive fact brought out in this investigation has been the marked improvement in the general health of the patients when diseased conditions of the teeth and tonsils have been properly treated. This was often noted even when no change was apparent in the joint condition.—*N. Y. Medical Journal*.

Washing Amalgams.—The washing of amalgams, to a considerable extent, destroys their strength and should never be done. It is practically impossible entirely to remove the substance that is used in the attempt to cleanse this material by the washing process, and fillings made in this way do not have the integrity of the non-washed article. Washing usually consumes enough time to allow the setting process to begin and makes the manipulation much more difficult and in no case improves the integrity of the filling. Manipulation in the hand has been claimed by some to injure the amalgam on account of incorporation of bacteria and grease, but if the palm of the hand is washed with alcohol and dried before the material is spatulated, this will not be true. Amalgam is a splendid tooth saver when carefully manipulated, and I particularly desire to stimulate interest in the use of this material. It is not a cheap filling,

but ever since its introduction it has been manipulated in a cheap manner by many operators.—THOS. P. HINMAN, D.D.S., *Dental Items of Interest*.

Disases of the Antrum.—The maxillary sinus may be the seat of catarrhal inflammation, empyema or suppurative inflammation, impacted teeth, tumors and polypi. Catarrhal inflammation is usually the result of extension of catarrh from the nose and associated air cells. The inflammation extends from the middle meatus of the nose by way of the hiatus semilunaris and ostium maxillare. The mucous membrane becomes swollen and secretes mucus. This blocks up the ostium maxillare, and when the antrum is filled the pressure gives rise to pain. This may be termed simple acute catarrhal inflammation, and is not necessarily operative, but may be treated with nasal sprays. A 2% solution of cocain in 1/1000 adrenalin chlorid applied on a probe wrapped with cotton will give almost immediate relief, and will allow the antrum to empty by constricting the tissue surrounding the ostium maxillare.—S. MARSHALL WEAVER, *Dental Items of Interest*.

Etiological Factors in Pyorrhea.—For convenience sake, the etiological factors of pyorrhea may be divided into groups, predisposing and exciting. Such a division is necessarily an arbitrary one, since it is impossible in all cases to draw an accurate line between the two, as under certain conditions a single factor may at once predispose and excite. An unsanitary mouth may be said to be an example of this kind. It is desirable, therefore, that every case presenting for treatment be carefully studied with a view to determining as accurately as possible the factors which have caused it; for no case can be intelligently treated in which there is not a clear comprehension of all the forces which have entered into its causation. It must be obvious that unless these are recognized and removed, all efforts at correcting the pathological changes which have taken place in the tissues themselves will be more or less futile.—ARTHUR H. MERRITT, *The Dental Cosmos*.

Importance of Mastication.—Considering the various functions of the teeth, that of mastication is of first importance. The proper fulfilment of the acts of grinding, macerating and insalivating food by chewing, not only prepares it for digestion in the stomach and intestines, but what is of equal importance to the teeth, stimulates the cells by exercising the investing tissues, which protect the teeth and from which they obtain their nourishment and, consequently, their health. Anything less than sufficient mastication sends the food improperly prepared. In time, digestive function and metabolism become deranged, resulting in a diminished supply of the cell building elements in the mouth. Thus, beginning with the lack of normal exercise in the act of chewing, there is concluded a vicious cycle of events, which aid in producing subnormal nutrition to the teeth and the investing structures.—PAUL R. STILLMAN, D.D.S., *Dental Items of Interest*.

A Note of Warning.—A note of warning should be sounded to the medical men, who are reading so much in their own literature about the evils of bridges and crowns, and ill-fitting dental appliances. They should not too hastily speak words which may induce the patients to believe that all bridges and crowns are dangerous and a menace to health. Let the medical men remember that carefully constructed appliances are a blessing to those who require them. Let them seek the advice of an earnest doctor of dental surgery and be assured that their patients will be benefited.—F. E. BURTON, D.D.S., *American Dentist*.

Cast Splints.—Cast splints are by no means new. Port in 1890 and 1905 described a cast splint of the Gunning type made of tin, also Hauptmeyer in 1908 described a method of using cast splints of tin in connection with the headgear. Cole and Bubb (*British Medical Journal*, 1916) used the cast interdental and Gunning splint of aluminum. A cast splint made of a metal which in general has proved to be well borne in the mouth, a metal that will melt at a low temperature, and one that will cast without pressure or suction, thus eliminating the use of a casting machine, would seem to be particularly desirable for war work. Tin has much in its favor, for the following reasons: During the last sixty years, tin, alone or alloyed with some other metal, has been used for cast lower dentures. During this period thousands of these dentures have been made and worn, and up to the present date is but a single case of "tin poisoning" reported.—JAS. EDWARD AIGUIER, D.D.S., *Dental Cosmos*.

Apical Infections.—Specimens studied give evidence that the involvement of the bone is usually more extensive than is shown by the dark area representing the abscess cavity on a Roentgen film. This is indicated by the osteoporosis of the bone surrounding the actual abscess cavity. I have previously pointed out that in treating a chronic alveolar abscess or dental granuloma of long standing, the most important factor is the necrotic root apex which Nature tries to eliminate, as in the case of sequestra. The sterilization of the root canal merely prevents reinfection. The exposition of the specimens described brings out the fact that the treatment should also be directed towards the disease of the bone.—KURT H. THOMA, M.D., *Dental Items of Interest*.

Interpretation of Radiographs.—Dental radiography, in order to be of diagnostic value, must be carried out by radiographers to whom dental anatomy and pathology are an open book. The technic of radiography, and here we mean specifically the mechanics of radiography, is a relatively simple matter, at least one which does not demand of the individual a superlative degree of skill or anything akin to it. The interpretation of dental radiographs is altogether a different matter. Here the untrained mind in the process of disease etiology and disease evolution must find itself at bay correctly to interpret the shadow densities and a diagnosis on so flimsy a foundation must of necessity lead, in a

series of cases, to serious complications. Cases have recently come to the writer's attention in which a definite diagnosis of pathologic conditions supposedly present in the mouth had been made by radiographers whose training in dental pathology and clinical dentistry was nil, in fact by men who perhaps know the mechanics of radiography as far as the production of pictures is concerned—pictures in which correct anatomic proportions are not always to be discerned—but with no medical or dental training whatsoever. This is truly appalling, especially because it is a reflection of the erroneous conception of radiographic diagnosis and of its possibilities when in the hands of the expert radiographer.

When some of these requisites are happily combined such valuable studies and conclusions as those of Dr. McCoy's are possible and irrefutable, otherwise the radiograph becomes a dangerous weapon, one which should be as strongly condemned as the product of the radiographer-pathologist should be praised.—DR. ENDELMAN, *Dental Register*.

To Grind Natural Teeth Painlessly.—Much of the discomfort in the use of stones is occasioned by the jarring or vibration of the stone against the tooth. If the tooth is held firmly in the socket or against one wall of the socket with the thumb or finger of the left hand while grinding down enamel or opening cavities with stones it will minimize the discomfort immeasurably. Of course it is understood that all stones should run smoothly and true and that a stream of water should flow on them while cutting. If these precautions are taken, any ordinary case of grinding can be done painlessly.—E. D. in *Dental Review*.

Management of Children.—In the clinic, it has been my point to be cheerful and sunny and make the children want to come and see me, which they do. Certainly this can apply to a private practice. If the child meets a cheerful dentist, full of optimism and little stories and kindness, it makes a better impression than a ministerial looking man, more the pessimist than the optimist, whose only desire is to have them get in and get out of his chair as quickly as possible.

The young man just entering the fertile and useful field of dentistry would do well to study each and every youngster he meets; no harm can come of a little study into the psychic state of the child mind.—WM. C. MILLER, *Dental Digest*.

OUR ARMY AND NAVY

COMPILED BY LELAND BARRETT, D.D.S.

GOVERNMENT INSURANCE AFTER THE WAR

The U. S. Government gives all men in the military and naval service the opportunity and privilege to keep up their insurance after the war has officially terminated and even after they have returned to civil life.

More than four million officers and men are now insured through the Bureau of War Risk Insurance. The grand total of insurance is more than \$36,000,000,000.

In its present form this insurance is annual, renewable term insurance at net peace rates, issued against death and total permanent disability. Under the provisions of the War Risk Insurance Act every person holding this insurance may keep it up in this form even after he leaves the service for a period of five years. All that is necessary is the regular payment of premiums.

Moreover, the law provides that not later than five years after the termination of the war as declared by Presidential proclamation, the term insurance shall be converted, without medical examination, into such form or forms of insurance as may be prescribed by regulations and as the insured may request. In accordance with the provisions of the law, these regulations will provide for the right to convert into ordinary life, 20-payment life endowment maturing at age 62, and into other usual forms of insurance. This insurance will continue to be Government insurance. The various forms of policies which the Bureau of War Risk Insurance will write are now being prepared.

Every person in the military or naval service owes it to himself and to his family to hold onto Uncle Sam's insurance. It is the strongest, safest and cheapest life insurance ever written. Just as this insurance relieved our soldiers and sailors of anxiety and misgivings for the welfare of their loved ones and protected them against the hazards of war, so it will continue to protect them through the days of readjustment and reconstruction and in time of peace.

The advantages of keeping this insurance in force cannot be emphasized too strongly. The right to continue it is a valuable right given by the Government to our fighting part of the men as compensation for their services. If this right is lost by allowing insurance to lapse it can never be regained. When Government insurance is allowed to lapse the holder cannot again obtain insurance except from private companies at a considerable increase in cost. Moreover, many of the men have become uninsurable as a result of the war through physical impairment, and if these allow their insurance to lapse they will lose the last opportunity for their families to have the protection of life insurance.

The economic value of life insurance to society is so well recognized as to need no argument. The Government now has in force upon the lives of four million American citizens who have fought its battles a life insurance group larger than all others combined. Therefore it is manifestly of the highest importance not only to the fighting men and their dependents, but to all the people, that the largest possible percentage of this insurance shall be continued in force after the holders shall be returned to civil life.

Army and Navy Register.

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ATTEMPTED APPOINTMENT TO NON-EXISTENT OFFICE

An officer received an order appointing him to the grade of colonel, Dental Corps, when all the colonels permissible by law in the Dental Corps had been appointed and were holding rank as such. This was in effect an attempt of the Executive to create and fill a non-existent office. As all offices must be created either by the Constitution or legislative enactment under the Constitution, the Executive could not of his own act create the office in question. The attempted appointment is not even a de facto appointment, as the office did not exist. The colonel in question should return to the Adjutant General of the Army the letter or notice of his appointment and refund to the proper accounting officer the difference in salary between that of colonel and of the office held by him prior to his appointment.

Army and Navy Register.

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ENLISTED DENTISTS WILL GET COMMISSIONS

By Evening Mail Staff Correspondent

WASHINGTON, Dec. 6.—Dental graduates who have been serving as privates in the Army will be commissioned first lieutenants in the inactive list of the Reserve Corps, United States Army, subject to service at any time within the next five years.

A number of dental students enlisted in the Army previous to their graduation. They were allowed to continue their studies until they did graduate, when they were called for duty. Although there was much objection to their serving as privates, no commissions were offered them. Today, however, such graduates as are stationed in Washington were notified by the Surgeon General they would be commissioned previous to their almost immediate discharge.

Daily Paper.

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CERTIFICATES OF RECORD FOR NEXT OF KIN

Representative Swift's bills (H. R. 13154 and 13155) provide that the Secretary of War and the Secretary of the Navy be authorized and directed to issue to the nearest of kin of all enlisted men and women who died while in service of the world war a certificate giving a complete history of the record of the deceased.

PROVIDES FOR RETAINING UNIFORMS

Representative Vestal has introduced a joint resolution providing as follows:

That each and every soldier and sailor in the Army and the Navy of the United States, and in the Marine Corps, who is now or has been at any time engaged in such service since the declaration of war by the Government of the United States against the Imperial Government of Germany, and who has been or who shall hereafter be honorably discharged from such service, be, and is hereby, authorized and permitted to retain and keep as his own individual property the uniform or uniforms, including overcoat, worn by him or in his possession at the time of his discharge from such service: Provided, That such uniforms shall only be worn by said discharged soldier, sailor, or marine subject to such regulations as may be prescribed by the Secretary of War.

Army and Navy Register.

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WAR NOT ENDED

The following general order has been issued to the Army:

The signing of the military armistice enables us to suspend the intensive military preparation in which the country was engaged. It does not, however, signify the formal end of the war, and it will, therefore, be necessary for us to keep under arms a substantial Army until we are certain just what the military needs of the country will be. The men in service in the United States will be demobilized as rapidly as is consistent with the needs of the Government, and the War Department is working with the other agencies of the Government toward a rapid re-establishment of normal business conditions and the restoration of the soldiers to their homes and occupations. In the meantime, I desire to express to the officers and soldiers under arms in the United States the appreciation of the department for their patriotic zeal and service. That they were not called upon to go abroad and not permitted to participate in the historic struggle in France leaves them none the less a part of the great Army of our nation and entitled to the thanks of the nation for their readiness to serve. All officers and men can rely upon the sympathy and activity of the department in their early return home. Both officers and men will realize that it is their duty to continue with the training and work and to maintain in the highest degree the discipline and soldierly bearing which is the great glory of the Army of which they are a part.

NEWTON D. BAKER,
Secretary of War.

(387.4, A. G. O.)

By order of the Secretary of War:

PEYTON C. MARSH,
General, Chief of Staff.

Army and Navy Register.

CAMPAIGN AGAINST "COOTIES"

The War Department authorizes the following statement from the Office of the Surgeon General:

America need have no fear that when the soldiers return from the battlefields they will bring with them the "cooties" which transmit dangerous diseases. Under the direction of the Surgeon General an elaborate plan is now under way to prevent these pests from passing into civil communities. The plan calls for protection not only for the returning soldiers, but also for the men now stationed in the camps and training stations in the United States.

Every soldier returning from abroad will be "deloused" in such a manner that it is as near certain as a thing can be that when the men leave the Army they will leave behind them all lice.

Forty-five delousing plants are now being erected by the construction division of the Army in the various camps and posts in this country. These will be finished in about six weeks. The erection of these plants will cost the Government approximately \$1,500,000. This is insurance not only against outbreaks of typhus fever, relapsing fever and trench fever, but also against impaired vitality on the part of persons unfortunate enough to be afflicted by the "cooties."

Special "cootie" inspections are made in all camps and training posts in this country. In addition to the medical examinations the men will be required to make personal examinations of their bodies and clothes every day.

The importance of body cleanliness will be impressed on every man in the camps. There has just been prepared a three-reel moving picture, called "Fighting the Cootie," which shows not only how to guard against the pests, but also the manner in which they are transmitted from one person to another. The film also demonstrates how the efficiency of the soldier is affected by lice. The pictures of the vermin were taken through the microscope. The film was prepared by the Instruction Laboratory of the Army Medical Museum. It is regarded as a distinct contribution to scientific knowledge. Prints are now being made and the film will be shown to all soldiers. Copies are expected to be sent to Europe.

Army and Navy Register.

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TABLE D'HOTE MEALS

The Director General of Railroads authorizes the following:

The United States railroad administration and the War and Navy Departments have recently agreed upon an arrangement for furnishing meals in dining cars and eating stations to officers and enlisted men which is proving very popular with men in the service. The War and Navy Departments have raised the meal allowance to 75 cents. In some instances the former allowance was 50 cents and in others 60 cents.

Orders have been issued that a substantial and appetizing table d'hote

meal be furnished for this sum. The weight of each article on the menu will equal or exceed the Army and Navy rations.

The arrangement will apply to officers and men traveling at their own expense as well as to those who are traveling on Government orders and includes inducted men on their way to enter the service.

Army and Navy Register.

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NAVAL DENTAL CORPS

Progress is being made in the naval dental school, recently established at the naval training station, Great Lakes, where about thirty young dental officers are under instruction. The courses are six weeks in length and consist of both naval and professional subjects, the purpose being to prepare newly appointed dental officers for their duties afloat and ashore in the Navy. The Dental Corps of the Navy now consists of about 500.

Army and Navy Register.

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ARMY OFFICERS BREAK REGULATIONS

The War Department has called the attention of commissioned officers to the fact that the Army uniform regulations are being broken by many of them in several particulars. Special attention is called to the regulations concerning the wearing of overcoats and raincoats and the insignia thereon. Olive-drab overcoats not longer than ten inches below the knee or not shorter than one inch below the knee, are the only authorized overcoats for winter wear. Rank is designated by braids on the sleeves of overcoats only. Drab moleskin overcoats lined with sheep skin are only authorized for wear in camps and under the regulations prescribed by the camp or division commanders. The wearing of the so-called "trench coat" is prohibited in the United States except as a raincoat. Waterproof coats or capes and raincoats, as nearly as practicable the color of the olive-drab service uniform, may be worn in rainy or other wet weather, but they should not be worn for purposes of warmth. Neither insignia of rank on the shoulder loops nor braid as sleeve ornamentation will be worn on raincoats. No officer or enlisted man is permitted to wear any campaign badge or ribbon, even though he has taken part in a campaign until he has submitted his claims to the Adjutant General and received specific authorization to do so. The badges and their respective ribbons are issued by the Quartermaster Corps after the service of the individual has been verified. Ribbons representing military societies will not be worn with service uniforms. Gold service chevrons for six months' service in the theater of operations and blue chevrons for periods of less than six months are authorized, but a gold and a blue chevron must never be worn together. While fractions of the first six months' service are recognized after one gold chevron has been awarded, a blue one is never awarded, but when a second six months' period has elapsed a second gold chevron is authorized. There is no authorization for the wearing of a

gold or silver star above the service chevrons, which is supposed to designate membership in the first 50,000 to disembark overseas. The wearing of overseas caps by officers and men is prohibited in this country, except at ports of embarkation and only by men about to embark or those who have just disembarked.

Army and Navy Register.

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The total number of influenza cases in the Army, as compiled up to Nov. 2nd, was 302,252, and the pneumonia cases number 49,224, with deaths from all causes since the outbreak of the epidemic amounting to 16,624. In the Navy the decline is marked, according to a statement given out by the Surgeon General this week. There were 2,091 new cases last week, as compared with 4,373 for the previous week. Deaths last week due to influenza, so far as reported, amounted to 207, against 387 the week before.

Army and Navy Register.

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VACCINATION AGAINST PNEUMONIA

The experiments of the Army Medical Corps with vaccination against pneumonia due to the pneumococcus, Types I, II and III, in two of the Army camps have had so much apparent success that a memorandum has been issued to officers, enlisted men, and employees of the War Department, announcing that this prophylactic vaccination is available to all who desire it. At Camp Upton during a period of ten weeks, no cases of pneumonia due to the types of pneumococcus mentioned, occurred among vaccinated troops, and pneumonia due to other organisms was only one-tenth as high among vaccinated as among the unvaccinated, although previous to vaccination the pneumonia had occurred equally in the two groups. The vaccine employed is a lipovaccine. It is given in a single injection, containing pneumococci, Types I, II and III. Reactions from injections, etc., are, as a rule, less pronounced than after the use of antityphoid vaccination. The vaccination is not intended to cure those who are ill with pneumonia, and it is not advised for persons who are suffering from acute colds or fever.

Journal A. M. A.

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WAR SERVICE RECOGNITION FOR NAVY

The officers and men of the Navy are to have a mark of recognition for actual service in the war zone, and for wounds received at the hands of the enemy. A board of naval officers recently considered this question, which is somewhat more involved than the plan adopted for foreign service in the Army, since it was necessary to provide the limitations of service afloat within which the chevrons were to be awarded. The order issued by Secretary Daniels settles the matter by fixing the geographic limits within which service must have been performed for a period of three months. The order is retroactive to include all service in the war zone since April 6, 1917; and further provides recognition for those who have

incurred the risk of the enemy submarines in home waters since May of this year. The war service chevron includes also members of the Aviation Corps who have made flights in search of enemy vessels in home waters. The chevron, which is identical for both war service and for wounds, consists of an inverted V-shaped bar, of gold braid for blue and yellow silk lace or braid for white uniforms, and is worn on the lower half of the sleeve, on the left sleeve for war service, and on the right sleeve for wounds. A wound chevron may be worn for any wound in action requiring treatment by a medical officer, and includes disablement by being gassed, providing medical treatment is necessary.

Army and Navy Register.

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The convention of the National Dental Association, which was held during the Summer at Chicago, was attended by several delegates from both the Army and Navy Dental Corps. The association conferred honorary membership upon Surgeon General Braisted, of the Navy, and Surgeon General Gorgas and General Noble, of the Army. It is expected that examinations will be held next January to fill places in the Dental Corps of the Regular Army. There will be in the neighborhood of seventy vacancies.

Army and Navy Register.

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At the November meeting of the First District Dental Society of New York, honorary membership, by unanimous vote, was conferred upon Colonel W. H. G. Logan, M. C., in charge of the Dental Department of the U. S. Army Medical Service, and upon Commander W. N. Cogan, of the Bureau of Medicine and Surgery of the Navy Department, in recognition of their services to the cause of dentistry in the war.

LELAND BARRETT,
Recording Secretary.

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APPOINTMENTS AND PROMOTIONS IN ARMY DENTAL CORPS

Aug. 31st.—Appointment of following in Dental Corps during existing emergency announced: To be Majors—Capts. Merton M. Postle, James L. Clements and John P. Garriott, Dental Corps. To be Captains—First Lieuts. Benjamin Naidis, Reginald L. Felton and Edgar T. Haynes, Dental Corps.

Sept. 7th.—Appointment of following first lieutenants to captains announced: Wall M. Billings, Wm. I. Setzekorn, John F. Ailworth, Gerald F. Stoodly, Bernard Ragland, Walter F. P. Zell, Edwin V. Morris, Herman J. Keyser, Daniel Jutton and Thomas W. Conly.

Sept. 21st.—Col. Wm. H. Chambers from duty at general hospital 6, Fort McPherson, Ga., to Charleston, S. C., for duty as department dental surgeon.

Appointments of following first lieutenants to captains for existing

emergency announced: Roy H. Kernohan, Harry L. Westney, Wm. H. Delbridge, James W. Simpson, James B. Eastman, Archibald R. Lucas, George A. Bullard, Edmund U. Potter, Page P. A. Chesser, Harold M. Whitney and Henry H. Thacker.

Sept. 28th.—Appointment of following first lieutenants to captains for existing emergency announced: Lawrence K. Anderson, Leslie D. Baskin, Charles H. Brammell, George Krakow, Harry E. Smalley, Francis M. Tench, Richard K. Thompson, Wm. C. Webb, Jr., Theodore D. Grannick and Julius Seamans.

Appointment of First Lieutenants Arthur T. MacMillan and Clark J. Hollister to captains for existing emergency announced.

Oct. 5th.—The following from duty in Hawaiian Department to San Francisco, Cal., for orders: Majors Harry M. Deiber, Walter L. Reesman, Oscar G. Skelton and Emmett P. Varvel.

The following from duty in Philippine Department to San Francisco, Cal., for orders: Majors Eugene Milburn, Don G. Moore, Harry C. Peavey, Charles Taintor, Robert B. Tobias and Lowell B. Wright.

Advancement in rank of following dental surgeons announced:

To be lieutenant colonels from October 6, 1917: John A. McAlister, Jr., George H. Casaday and Julien R. Bernheim.

To be majors from October 6, 1917: Mortimer Sanderson (deceased), John H. Snapp, Wm. A. Squires, Arnett P. Matthews, John W. Scovel and Charles DeW. Deyton.

Appointment of Capt. Clinton C. Messner to major for existing emergency announced.

Appointment of following first lieutenants to captains for existing emergency announced: Millard F. Stembridge, Angus M. Sellers, Theodore J. Richardson, Alva L. Cowart, Richard F. Doran, Frederick L. Litty, Jonas H. Stewart, Roy D. Smiley, Rozelle M. Cope, Louis T. Austin, Hugh D. Conlon, Wm. A. Duffy, Nelson T. Shields, Jr., Ernest P. Shaw, Walter B. Reeves, James M. Ackley, Roy White, LeRoy D. Shafer and Charles Van B. Beard.

Oct. 12th.—Lt. Col. George I. Gunckel to report to retiring board at Washington for examination.

Appointment of First Lieut. Reuel May to major for existing emergency announced.

Appointment of following first lieutenants to captain during existing emergency announced: Rudolphe T. Turcotte, Emil L. Aison, Joseph A. Ahern, Victor A. Vores, Robert J. Steedman, Theodore C. Swendsen, Clarence S. Lister, John H. Malony, Moses C. Beal, Hurst V. Boyd, Matthew F. Carney, Lawrence T. DeVine, Dudley C. Hughes, O'Gorman J. Lane, Willis R. McCorshery, Edward L. Masten, Frank W. Meeske, Joseph F. Mulcahy, Elmer E. Purington, Harry E. Rice, Francis P. Riggs, Arthur C. Webb, Herman R. Moore, Walter W. Gochenour, Robert E. Giddens.

Oct. 19th.—Appointment of following first lieutenants to captains for existing emergency announced: Julius D. Goldman, George M. Frith, Richard C. Hughes, Vincent A. Hannigan, Edward B. Riblet, Wm. E. Mentzer, Aaron R. Crane, Frank M. McFarland, Floyd E. Clinite, Charles T. Miles, John E. O'Flinn, Atwell L. Benton, Harry V. Talbert, John A. Zwisler, Wm. P. Higgins, Ross O. Dickson, Charles B. Amis, Robert E. Giddens, Frank Vaughan, Henry H. Facticeau, Benjamin F. Pound and Andrew I. Denney.

Oct. 26th.—Appointment of following captains to majors for existing emergency announced: Frederick L. Litty, David A. Proctor, Wm. F. Blair, John F. Connolly, Clyde E. Duncan, Idus W. Shields, Earle Robbins, John J. Collins and Kyle B. Alsobrook.

Nov. 2nd.—Appointment of First Lieuts. Jacob L. Brause and Clifford Strange to captains during emergency announced.

Nov. 9th.—The following to Fort Oglethorpe, Ga., for instruction: Majors Oscar G. Skelton, Emmett P. Varvel, Walter L. Reesman and Harry M. Deiber.

Appointment of following in Dental Corps during emergency announced: To be captains—First Lieuts. Wm. S. Carrick, Ralph L. Faulkner, Charles W. Marriott and John C. Zeidler, Dental Corps.

Nov. 16th.—Major Don G. Moore to Fort Oglethorpe, Ga., for course of instruction.

Major Shirley W. Bowles to Anniston, Ala., Camp McClellan, for duty in base hospital 127.

Appointment of following in Dental Corps during emergency announced: To be captains—First Lieuts. Wm. W. McCrillis, Walter F. Neuhoff, Walter J. Allison, Wm. R. Clickener, Lincoln Van Orden, Philip P. Bliss, Henry R. Allen, Wm. E. Ross, Carl F. Crecelius and Frederick H. Huff, Dental Corps.

Nov. 23rd.—Major Harry M. Deiber to Washington for duty in office of attending surgeon.

Major Wm. A. Squires, Camp Sheridan, Ala., to ninth division as division dental surgeon.

Major Samuel Kaufman to Alexandria, La., Camp Beauregard, for duty.

The following to Camp Upton, N. Y., for duty with base hospital 136: Majors Peter C. Krupp and Walter H. Richardson.

Capt. B. Lucien Brun, Dental Corps, major, Dental Corps, U. S. Army, during existing emergency.

Nov. 30th.—Major Earl C. Braniger, Fort Des Moines, Ia., to duty with base hospital 144.

The following to camps for duty as camp dental surgeons: Majors Eugene Milburn, Camp Cody, N. M.; Harry C. Peavey, Camp Hancock, Ga.; Charles Taintor, Camp Bowie, Tex.; Robert B. Tobias, Camp Greene, N. C., and Lowell B. Wright, Camp Funston, Kan.

CURRENT NEWS

Compiled by LELAND BARRETT, D. D. S.

Hospital Transferred.—The trustees of the New York Polyclinic Hospital have proposed to transfer the property of that institution to Columbia University to be maintained for the public, and for advanced instruction and research in medicine and surgery. The hospital was built in 1912 and has a capacity for 300 patients.

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DISTRICT OF COLUMBIA

Additional Personnel for Medical and Dental Inspection of Schools.—

The new appropriation act for the District of Columbia considerably enlarges the force of medical and dental inspectors of public schools, increases the number of school nurses, and provides for four dental clinics in the public schools to be served by eight dental operators, who shall be half-time dentists at \$700 per annum, and four prophylactic operators, who shall be graduate nurses trained in the inspection and cleaning of teeth; these last are to be full-time employees at \$900 per annum. The number of medical inspectors is increased by one, and of dental inspectors by two, making the new numbers twelve and four, respectively. There are to be three additional school nurses—ten in all—at \$1,000 per annum.—*Journal A. M. A.*

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DR. CARNEY A GOOD FIGHTING MAN

Excerpt from the *N. Y. Evening Sun*:

"One thing more I'd like to speak of, and that is of the bravery of Father Kelly and *Dr. Carney*, chaplain and dentist of our outfit. Both were out in the thick of the fighting, never taking cover and doing everything they could for the troops. . . ."

The many friends of Dr. Matthew Carney, member of the Editorial Staff of this JOURNAL, will not be surprised, but nevertheless stirred with happiness and pride in reading this fine tribute from Capt. Thomas S. Murray, late of the 27th Division, before Cambrai, who closed a long and interesting account of his experiences with this comment.

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AFTER-WAR PROBLEMS

Senator Weeks, of Massachusetts, has been the author of a number of valuable proposals, some of which have failed of the congressional adoption they deserved, notably the project for a joint committee on war expenditures and that for a governmental supervision of the methods of seeking funds for war charities. Now he has presented for the con-

sideration of Congress, with the endorsement of his party associates, a plan for a joint congressional committee on reconstruction. It is proposed that this committee shall consist of six Senators and an equal number of Representatives divided as to political faith, which committee shall undertake the investigation of and to report upon a variety of subjects constituting problems that will inevitably arise during the change from the activities of war to the pursuits of peace. The committee is charged also with making recommendations of necessary legislation. Senator Weeks' schedule of subjects is as follows:

1. Problems affecting labor, including—
 - (a) Unemployment which may follow war.
 - (b) Utilization of discharged soldiers and sailors in civil employments.
 - (c) Conciliation and arbitration of labor disputes.
 - (d) The relation of men and women in similar employments.
 - (e) Substitution of female employes for male and vice versa.
 - (f) Feasibility of organizing permanent employment agencies.
 - (g) Requirements for labor after the war, both in agricultural and industrial occupations.
 - (h) Distribution of labor.
 - (i) Employment of surplus labor on public works of which the construction or completion has been suspended due to the war.
2. Problems affecting capital and credit, including—
 - (a) All matters relating to trusts and combinations.
 - (b) Federal loans to private enterprises.
 - (c) Federal supervision of capital issues.
3. Problems affecting public utilities, including—
 - (a) The establishment of a railroad policy after the war and the relation of the Interstate Commerce Commission to the railroads.
 - (b) All questions relating to communication by wire.
4. Problems resulting from the demobilization of our industrial and military war resources, including—
 - (a) The disposal of surplus Government properties and supplies in this country and abroad.
 - (b) The conversion of munition industries into those of peace.
 - (c) The demobilization of the war strength of the Army and Navy and the disposition of the men who have been in the service.
 - (d) The demobilization of civil war workers.
5. Problems affecting our foreign trade, including—
 - (a) The development of new markets.
 - (b) Combinations for the purpose of increasing our selling facilities.
 - (c) Changes in our banking facilities necessary to co-operate with such trade.
6. Problems affecting the continuance of existing industries and the establishment of new industries, including—
 - (a) The supply and control of raw materials.

(b) The encouragement of the production in the United States of articles that have not been made in this country heretofore.

(c) The encouragement of private enterprise in the development of the resources of the public domain.

(d) The utilization of a tariff on imports as a means to protect and encourage home industries.

7. Problems relating to agriculture, including—

(a) The advisability of continuing after the war price fixing of food products.

(b) Federal loans to farmers.

(c) Distribution of food products.

(d) The allotment of lands to returned soldiers and sailors and their establishment in new homes on the public domain.

8. Problems affecting the adequate production and effective distribution of coal, gasoline and other fuels.

9. Problems relating to shipping, including shipyards, and especially in regard to the sale, continuance of ownership, or leasing of both yards and ships.

10. Housing conditions and the disposition of houses constructed by the Government during the war.

11. War legislation now on the statute books, with reference to its repeal, extension, or amendment.

This is one of the most important issues to engage the consideration of those in authority in this country. As a nation we have been as backward and reluctant and indifferent in regard to the unknown conditions that will prevail after the war as we were in preparing for war. There is some explanation, if not an excuse, for the latter in the lack of interest taken by the people for years in the warnings of the military-naval authorities resulting in a public sentiment that refused to support Congress in granting the annual requests of the War and Navy Departments for adequate funds for national defense. But there is no excuse for delay in acting, and still less for failure to act, in providing the means of properly coping with the manifold, complex and vital phases of the after-war situation.—*Army and Navy Register*.

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CONSCIENTIOUS OBJECTORS IN THE ARMY

Some interesting observations in regard to conscientious objectors have been made in a report to the War Department by Colonel Sedgwick Rice, of the cavalry arm, who is commandant of the U. S. disciplinary barracks at Fort Leavenworth. Nearly 100 of this class of prisoners have been admitted to the institution. It is stated that they differ greatly in their reasoning, as might have been expected when they are capable of such a mental performance; that objection on the ground of religious views is most prevalent; that others simply entertain delusions; that practically all of them speak German, which may account for the trend

of their consciences; that some of them are weird in their ideas, ideals, theories and expressions, although many of them are sincere in their beliefs; that they are narrow-minded and obstinate in their convictions when they are sincere; that "most of them state they are following their own ideas," their arguments being poor, and "their high ideals are probably supported by physical fear." It is also significant to learn that "those that object for political reasons constitute a conglomerate mass. Some are well educated, smooth-talking, eccentric individuals, who are endeavoring to declare the draft law unconstitutional and evade military service in this way. Others are slackers, who are trying to preserve themselves by their high ideals and are entirely satisfied to be in prison rather than at the front. Quite a few of these objectors are suffering from mental disease and are refusing to go into the Army because of delusional ideas." These have been scientifically classified by experts, and it is announced that "a careful survey of this group will probably be made in the near future."—*Army and Navy Register*.

* * * * *

Cancellation of Appeal for Collection of Scrap Platinum.—The chief of the section of medical industry and the chief of the platinum section announce to the doctors and dentists of the country their appreciation of the hearty response made to the call for scrap platinum, and request that no further scrap platinum be turned to the Government through the channels indicated in their previous communication.—*Official*.

* * * * *

F. W. Brock, bureau of investigations, *New York Tribune*, sends the following letter, which is self-explanatory, and of interest to the dental profession:

The Ad-Visor,
N. Y. Tribune,
New York City.

2 Lombardy Street,
Newark, N. J.

Dear Sir:—

Can you give any information regarding Imperial Art Company, Room 1714 Tribune Building?

Some three years ago this Company sent a man by the name of J. A. McClary, who resides at Rahway, N. J., to visit every physician's office in this State, with the following scheme: That they were going to publish a De Luxe edition of Fellow Officers and Members of the Medical Society of New Jersey, 1766-1912.

Each physician paid four dollars, which was supposed to cover the cost of engraving, biography and an order to have one photograph taken at a local photographer's. A call at the photographer's place gave the information that the above owed for some previous business, and they refused to honor the order, consequently nothing has been done in regard to the book. A formal demand made on J. A. McClary met with no

response and many of the medical profession throughout the state have been swindled out of hundreds of dollars in this manner.

Now, as I have understood that he is working a similar scheme among the dental profession, thought I would write to have you publish this letter, hoping perhaps thereby to warn others from falling for the same game. I have receipts and other data should you care to see or use them.

Thanking you in advance for publishing same, and for any information pertaining to same, I am,

Yours very truly,

(Signed) WINGFIELD S. DE VAUSNEY, M. D.

* * * * *

Presumably the following announcement from the *Army and Navy Register* applies equally to the personnel of the Dental Corps:

"*No Appointments in Medical Corps.*—There has been no promotions or appointments in the Army medical corps since the armistice was signed, and no policy has yet been adopted affecting future appointments. Until Congress takes some action it is improbable that any officers of the corps now in a temporary status will be transferred to the regular establishment, as it is not known what the strength of the regular corps will be. It may be decided to send inquiries with blanks to be executed to medical officers in the temporary service, with a view of determining how many desire to be transferred to the regular corps and who are qualified by reason of age, professional attainments, and their record during the war. Such an inquiry will, however, carry no assurance that any such permanent appointments will be made, at least until further legislation has been enacted fixing the size of the medical corps."

* * * * *

The origin of the caduceus as the emblem of the medical, dental and several other corps of the Army, may prove to be of interest to our readers. The story, from the *Journal of the A. M. A.*, is as follows:

"The caduceus, the rod surmounted by the extended wings and entwined by the two serpents, though regularly used in that connection, is not especially the emblem of the medical profession. According to the *Century Dictionary* the caduceus is a symbol of peace and prosperity and in modern times figures as a symbol of commerce. The rod or wand is supposed to be the wand of Mercury, the god of commerce. The rod represents power; the serpents represent wisdom, and the two wings, diligence and activity. As stated by Dr. Samuel P. Gerhard (the *Journal*, April 24, 1909), the true ancestral symbol of the healing art is the knotty rod and serpent of Esculapius, the device adopted for the emblem of the American Medical Association. The significance of this device is much the same as that ascribed to the caduceus, but as Dr. Gerhard has shown from history and mythology, the serpent as the represen-

tative of wisdom has been from time immemorial linked up with the healing art. Dr. Gerhard says:

" 'Esculapius was always pictured with a knotty rod in his hand, the knots indicating the many difficult problems of physics to be solved in the treatment of the ailments of mankind. Therefore, applying these thoughts to the symbol, we have in the entwined serpent, power, wisdom and health, together with the protection and support against disease and the difficulties to be overcome by the knotty rod. With this historical symbol the sanctity of medicine can be pictured and the doctor is shown in his true light, not only as a laboratory scientist and as a practitioner, but as a teacher and adviser to the patient, the family and the community in all the difficult problems that arise concerning health and disease.' "

* * * * *

Died in France, Monday, October 28, 1918, of pneumonia, Major Harold W. Estey, D. D. S.—Major Estey was a well-known Boston dentist, who was graduated from Harvard Dental School in 1897, and had practiced his profession in Boston for a number of years. Major Estey's military service began in 1897 as a private in the Reserve Corps Cadets, in which organization he became captain of Company A. Soon after the declaration of war Major Estey was detailed for service in France, being promoted to the rank of major. Soon after his arrival in France he was detailed to a French staff war college, and after completing the course of instruction, was regulating and liaison officer connected with the general staff. In April, 1918, he was decorated by the French government for extreme bravery under fire. Major Estey is survived by his widow, three young sons, three sisters and a brother.

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PREPAREDNESS LEAGUE OF AMERICAN DENTISTS

Part of a communication from W. D. Tracy, the director general:

It is desirable that all Form 3-D cards on which any work is recorded should be sent in promptly to the Headquarters Office. It is also desirable that all Form 18 cards on which work is recorded should be mailed to you as State Director and retained by you pending further instructions.

It is the intention of the Administrators of the League to retain the organization intact, and all officers, including departmental, State and local directors, are requested to retain their offices until notified to the contrary.

The President, Dr. J. W. Beach; the past Director General, Dr. C. F. Ash; the past Government Representative, Major Wm. A. Heckard (now at Camp Sherman); the present Government Representative, Lieut. J. V. Gentilly, and the undersigned, all tender to you their personal thanks for the very important share you have had in making it possible to carry out the plans of the League insofar as making the men of the Old National Guard and the New Army dentally fit is concerned.

And we all bespeak for the League your continued support and coöperation in obtaining the best possible results in our future endeavors.

Yours very truly,

W. D. TRACY,
Director General for the United States.

* * * * *

THE AMERICAN RED CROSS HOME SERVICE

The time will come after the disabled soldier or sailor has received the benefits of the Government's medical and surgical care and vocational training when he will go to work at his old occupation or in a new position which the Government has found for him. Our country will have done everything possible to restore to each man what has been taken and used in the national service. From this time the Red Cross and other community agencies will gradually take over the chief responsibility for such further assistance as the man may need. The rest depends upon the individual and his personal will-power and capacity for recuperation.

For many returned men who will supplement their innate resourcefulness with these advantages, no further assistance will be needed. Others, less forceful and self-reliant, or more seriously handicapped and disheartened, will require some degree of friendly sympathetic oversight and encouragement to carry them through the first critical months until they have found themselves in their new work. This is no work for a distant and impersonal official agency. Rather it is a task for personal friends close at hand and intimately aware of the man's everyday problems and difficulties. This is appropriate work for the Red Cross. It is especially appropriate work for the Home Service Section which in many instances has already had the privilege of helping to maintain intact the standards of health, education, and home life of the soldier's family during his absence.

* * * * *

FROM PRESIDENT BEACH, P.L.A.D.

America is to be the greatest nation of the world. Why? Because we are giving freely to help the rest of the world. Without the untold sacrifices we have made and the billions upon billions we have laid on the altar of humanity, we could not become great. Have we done this in a spirit of selfishness? No! We have done it without thought of reward. We are exemplifying our conception of the Golden Rule.

Do you think the millions of women working patiently month after month for the greatest organization in the world . . . the American Red Cross . . . are looking for personal benefit? Do you think that body of self-sacrificing girls and women who never think of themselves . . . our noble nurses . . . are looking for self-aggrandizement as reward for their labor of love?

Let us not debase our own thoughts by permitting even a suggestion of such things. You know it is not possible.

Where, then, does each one of us stand in relation to the world's work that is before us? Each one knows just how much he has done and what motives prompted him in doing it. This is a matter unto himself. But no matter how much we have done, we must do more. The only limit is our physical capacity.

The October number of the *Literary Digest* prints an article entitled "Europe Admiring Yankee Teeth." The teeth of our boys have been an object of admiration by the other armies, and the article makes special mention of the splendid services of American dentists. This is encouraging to us and indicates that our efforts are appreciated, and should prompt us to do more than ever to send our boys away in as good condition as possible.

Do you know that when our boys have toothache while in the trenches their teeth are extracted and they are sent back immediately? It does not matter if it is a front tooth that is aching—it must go, even though it could be treated and filled. When those boys return to civil life, they will be badly handicapped. We must avoid such a situation as far as possible by doing our duty by them before they leave their home town for camp. This is the duty of the League.

In a recent letter from a member of the dental corps now in France, he says: "The League is not forgotten over here. I have met many of our soldiers who had their teeth fixed by its members, and they are very grateful. I have met others who did not take advantage of the opportunity, and they are very sorry." The work you do for them is fully appreciated when they are "over there." Let us spare no effort to help our boys.

R. OTTOLENGUI,
Publicity Committee.

* * * * *

FROM CHAIRMAN GILLET

To all Members of the First District Unit, State of N. Y.:

You are requested to read carefully the following excerpt from a letter from Director General Tracy, sent out recently to the State Directors:

"In view of the fact that inductions into the United States Army through the Selective Service Act, have been discontinued, it is evident that the activities of the Preparedness League as far as free dental service to the drafted men is concerned are over.

"While this department of our work has been of paramount importance since the United States declared war on Germany, April 6, 1917, and up to the signing of the armistice on November 11, 1918, the League may now devote its time and energies to other fields of endeavor.

As you have already been informed, the League, in coöperation with

the Red Cross has developed a plan whereby the dependent families of soldiers, sailors and marines now in service or in training may have their dental needs taken care of by the members of the League, working conjointly with the Home Service Section of the Red Cross.

"In other words the H. S. S., through its routine activities, will find no doubt, a large number of individuals needing dental attention who are the immediate dependents of men in the service.

"It is the business of the Home Service Section to ascertain the circumstances of these patients and to certify their eligibility and worthiness to receive gratuitous services at the hands of the League members.

"All patients coming through the Home Service Section of the Red Cross will be provided with an identification card thus precluding all possibility of abuse of our offer.

"Through this service the dentists of the United States who have remained at home in pursuit of their professional work may, in a small measure, show their gratitude to the men who have left their homes and families to join the fighting forces and honor the memory of those who will never return.

"Through the endeavor of our President, Dr. J. W. Beach, and in coöperation with Colonel W. H. Thompson, in command of the Canadian Dental Corps, together with the Royal College of Dental Surgery, Toronto, Canada, a course in practical instruction in the most recent and approved methods of War Oral Surgery and Post War Dental and Oral Prosthesis has been developed.

"This Course was given in Toronto during the week of December 16 to 21.

"It is hoped and intended that this course will be the beginning of a series of like courses to be given during the season in several of the larger cities in the United States in order that civilian practitioners of dentistry may familiarize themselves, to a certain extent at least, with the details of these post war dental procedures. It is estimated that no small demand may be made upon civilian practitioners for this kind of work in the months to come and for this reason it will be wise for all those who can do so to take advantage of these opportunities."

We ask your continued help in this work of caring for the dependents of men in the service, who are certified to us by the Red Cross Home Service Bureau, as being in need of dental service and otherwise unable to obtain it.

Help to make sure that no man in the military service shall have opportunity to say that the dental profession allowed his wife, or children, to suffer pain, or to lose important teeth, while he was defending our rights and homes, because of lack of funds. We owe it to them to "carry on" till the breadwinners are again at their normal occupations.

The rumored plan of debarking all wounded at this port is an additional reason for holding our organization in readiness to give any needed help in our line.

SPECIAL POST-WAR COURSE
to be given under the auspices of
THE PREPAREDNESS LEAGUE OF AMERICAN DENTISTS
at Columbia University of Dental Infirmary.
35 West 39th Street, New York City.
January 20th to 25th, 1919, inclusive.

The Preparedness League of American Dentists, coöperating with the Department of Advanced Courses in Dentistry of Columbia University, will give a post-graduate course of instruction in oral surgery, physical diagnosis, anaesthesia, fractures, splints and dental prosthesis, at the Columbia University Dental Infirmary, 35 West 39th Street, New York City, from Monday, January 20, to Saturday, January 25, inclusive.

The fee for the course is \$50. The class will be limited in the interest of efficient instruction.

For detailed information and enrollment, address The Preparedness League, care of Columbia University Dental Infirmary, 35 West 39th Street.

R. OTTOLENGUI,
Director of Publicity.

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EXPANSION OF THE LEAGUE.

Our League has made a permanent place for itself. It has proven its usefulness to the dental profession and its necessity to the welfare of humanity. Its field of operation reaches wherever organized dentistry exists, and its public service may be felt to the extreme limits of civilization. Such is a brief outline of the field of our future endeavors.

In expanding the activities of the League, we desire, however, to lay down the following unvarying rules and principles that any misconception of our aims may not occur:

1. The principle of the League is Service to Humanity.
2. Politics or promotion of personal interests *shall not be tolerated*.
3. It is essentially an organization for public health service.
4. Its activities shall not conflict with other dental organizations in any way.
5. Its object shall be the co-ordination of all professional and public agencies which may thereby render better service for the common welfare of humanity.
6. No officer or member of the League shall receive pay for services unless of such character as to be justifiable, but not without proper action by a quorum.

These principles must be strictly adhered to or the organization cannot live.

At a meeting of more than one hundred dentists at the Royal College of Dental Surgery, Toronto, Ontario, on Dec. 19, 1918, a resolution was unanimously adopted for the appointment of a committee of Canadian and American dentists to meet in Buffalo, Jan. 11, 1919, to formulate plans for an international organization, using the League plan as the basis of procedure. Our members will be informed of the results as early as possible and final action will not be taken without the approval of those interested.

The wonderful power for good of such an organization cannot be estimated. It must be truly democratic and ever ready to extend a helping hand wherever our rightful province may reach. It is impossible to outline the possibilities in a few words, but I refer you to the editorial by Dr. Kirk in the December *Dental Cosmos*; also that by Dr. Ottolengui in the December *Dental Items of Interest*.

The great opportunity for the dental profession is at hand, and a magnificent work is before us. We will accept the responsibility, with the Golden Rule as our guide, and endeavor to prove faithful to the trust. Big things are before the American public today. We must rise to the occasion and think big, act big and DO big. It is up to us to see that our profession keeps pace with the leaders.

INSTRUCTION IN POST-BELLUM ORAL SURGERY AND PROSTHESIS

The course of instruction given at the Royal College of Dental Surgery at Toronto in December last, was the first one given in conjunction with the League, and without doubt it proved to be the best course given thus far.

The splendid faculty was composed of Lieutenant-Colonel Guy Hume and Major E. W. Cummer, representing Canada, and Arthur E. Smith, D.D.S., M.D., of Chicago, and Leroy S. Miner, M.D., D.M.D., Boston, representing the United States. This arrangement gave the meeting international significance and did much toward bringing about better relations of the profession on both sides of the border.

The Military was largely represented in the class numbering one hundred and four. Colonel Clayton, Dental Surgeon-General of Canada; Colonel W. H. Thompson, Commandant for Ontario, and several other provincial commanders were present, together with Deans Thornton of McGill University, Dubeau of Duval and Webster of the Royal College. From the States came State Director Hallenberg, North Dakota; State Director McIntyre, Rhode Island; two League members from Nashville; Tenn., and many others scattered about the border States. Director General Tracy as well as President Beach also were present to aid in making the gathering a great success. Great credit is due Dr. Wallace

Seccombe for his efforts in making necessary arrangements. The course stands in a class by itself and has set a standard for the League to strive to maintain.

The League wishes it distinctly understood that this is not a post-graduate course. It is to be known as a course of instruction in post-war oral surgery and prosthesis, to which it will be strictly confined. Bearing this fact in mind, one week of instruction is ample to cover the field, except in special cases.

The course to be given in New York early in February will essentially have the same faculty. It was difficult to secure Colonel Hume and Major Cummer, but this has been brought about through the courtesy of Colonel Clayton and Colonel Thompson. We are deeply indebted to these gentlemen for their sympathetic coöperation in this splendid work.

The League hopes to pursue this object until the States and Canada have been well covered and our members are prepared to render efficient service to our injured soldiers. The fee of \$50 is divided equally among the instructors, after necessary expenses have been met, the League or the collaborating institution receiving nothing whatever.

If you are not a member of the League—join now—we need you and you need us.

J. W. BEACH, President.

BOOK REVIEWS

By HAROLD S. VAUGHAN, M.D., D.D.S.

AN INTRODUCTION TO THE MAMMALIAN DENTITION. By T. WINGATE TODD, M.B., Ch.B., Manc.; F.R.C.S. Eng., Captain Canadian Army Medical Corps; and HENRY WILSON PAYNE, Professor of Anatomy in the Western Reserve University, Cleveland, Ohio, formerly Lecturer in Anatomy Victoria University of Manchester, England. With 100 illustrations. St. Louis C. V. Mosby Co., 1918. Price \$3.00 net.

The authors of this book recognize that a Dental Anatomy course calls mainly for a description of living types which can only be properly presented by reference to ancestral forms.

In the early chapters the dentition of the lower vertebrates (fishes) we observe the teeth to be of the cone type, the cusp type commencing in the Iguana. In Chapter III we have a study of the geological dawn of mammalian life, the difference between reptiles and mammals, the origin and development of mammal-like reptiles, then the various developmental types up to the parent form of mammalian teeth.

The relation between life habits and dentition show how environment and conditions of life have influenced the dentition of the various species. Chapter VII takes up human dentition, beginning with the earliest known type, the Heidelberg Mandible, through the various races down to modern man.

Retgression in evolution is shown in the Edentates as the sloth, armadillos and anteaters.

The carnivore, rodents and emgulates show well how the process of evolution have been worked out by environment and food supply, the organism develops and maintains its place by adaptation to cosmic conditions.

This book furnishes the dental student with a broad knowledge of the subject of dentition which will lead to a better understanding in the detailed study of dental anatomy.

PRACTICAL DENTAL METALLURGY. A Text and Reference Book for Students and Practitioners of Dentistry. Embodying the Principles of Metallurgy and their Application to Dentistry. Including Experiments. By JOSEPH DUPRE HODGIN, D.D.S., Professor of Operative Dentistry (formerly Professor of Dental Chemistry and Metallurgy) College of Dentistry, University of California. Revised by GUY S. MILLBERRY, D.D.S., Professor of Chemistry and Metallurgy and Dean of the College of Dentistry, University of California. Fifth edition, completely revised. St. Louis, C. V. Mosley Company, 1918.

This small volume, which has for many years been the standard textbook in dental metallurgy, now appears in the fifth edition. The properties and characteristics of the important metals and their compounds by union with non metals, the various methods for their reduction, makes up the first chapters.

The melting of metals, the principles employed in the reduction of ores, the various laboratory appliances, such as electric furnaces, blow-pipes, are explained.

The important metals, with their compounds and alloys, are fully covered and their dental uses are studied.

Chapters XXI and XXII give a detailed study of dental amalgams, reference being made to the work of all the pioneers in this development, especially the classical work of Black to whom the dental profession is indebted, for a scientific study of the problem of amalgam making, leading to the control of the properties of expansion, contraction flow, resistance to stress, edge strength and discoloration.

The book is well adapted for a laboratory manual, as all the necessary experiments and procedures are worked out.

In addition to its value as a textbook and laboratory guide, this small volume can be profitably studied by the practicing dentist.

ON THE FRINGE OF THE GREAT FIGHT. By Colonel GEORGE G. NASMITH, C.M.G., New York, George H. Doran Company, New York.

This book, written by a sanitary officer of the First Canadian Contingent, tells of some incidents in the assembling and training of the first division of these forces, it being a personal narrative of some of the important happenings seen by the writer, and his experiences in the course of his daily work.

One of the most notable of these being the second battle of Ypres when the Huns, adding to their barbarous methods, launched the first chlorine gas attack against this division and the French Colonials.

A description is given of the medical and sanitary organization in the field showing how by sanitary regulations the health of the army in the field is maintained, especially by safeguarding the water supply, the laboratory work in studying and isolating contagious cases, and "carriers" of typhoid and other diseases.

Much work was also necessary among the remaining civilian population in those areas.

Throughout the book are many incidents of personal experiences well expressed, which make for a pleasant evening's reading.

ELEMENTARY AND DENTAL RADIOGRAPHY. By HOWARD RILEY RAPER, D.D.S., Professor of Roentgenology, Operative Technic, Materia Medica and Therapeutics, Indiana Dental College, Indianapolis; Past Dental Surgeon to the Indiana School for Feeble-Minded Youth; Member American Institute of Dental Teachers, etc., etc. Second edition, pp. 500. New York, Consolidated Dental Manufacturing Co.; London, Claudius Ash, Sons & Co., Ltd., 1918.

Professor Raper's work is already known as the standard textbook on radiology; or as he prefers the term, radiography. This second edition is a distinct advance over the original issue in quality and quantity of material, and of form of presentation. The chapters on elementary electricity. X-ray machines and tubes are full and sufficient in every way for the student, and the treatment of the subject in its multiform applications in dental practice is complete and gratifying to the practitioner who wishes to improve his working knowledge of the making and reading of dental films. The illustrations—half-tones and diagrams—are plentiful; the text, exhaustive. In fact this book fills its place, and that place

is in every dental office—for the intelligent practice of dentistry is impossible without the familiar daily use of the X-ray picture. D.

TECHNIC AND SCOPE OF CAST GOLD AND PORCELAIN INLAYS, with a Chapter on Endocrinodontia, or the Ductless Glands—Their Expression in the Human Mouth. By HERMAN E. S. CHAYES, D.D.S. Pp. 392, 872 illustrations. St. Louis, C. V. Mosby Co., 1918. Price \$7.00.

This elaborate (and rather expensive) book is the work of an idealist; and as such is written with the refreshing consistency of unabated conviction. It is original and unconventional in form and substance and we wonder if certain chapters will stand the test of time when subsequent editions are in preparation. Dr. Chayes devotes about fifty pages, in the first place, to an allegorical-metaphysical dissertation on thought-sequence and the acceleration of human creative force; which of course is related, though somewhat remotely, to tooth anatomy and the cast gold inlay. When one gets into the spirit of the book it is easy to see that the writer knows his subject thoroughly, from all angles; it is the work of a radical expert. The book is full of first-hand information on an intricate subject; it is beautifully printed and illustrated on coated paper throughout. We believe it will be read and valued as a contribution on a topic which is still young in dental practice. D.

CORRESPONDENCE

MEDICAL AND DENTAL VETERANS

The following letter, which is self-explanatory, was received by Dr. Barrett in reply to his inquiry as to the feasibility of creating a "Section for Dental Membership" within the "Association of Medical Veterans of the World's War." Dr. Barrett suggests that such membership should be restricted to dental officers "who saw active service":

December 20th, 1918.

LELAND BARRETT, D.D.S.,
220 West 98th St.,
New York City, N. Y.

MY DEAR DOCTOR BARRETT:—

Your letter to Colonel Easby-Smith has been forwarded to me for reply, he having gone abroad.

The dental profession of the United States did yeoman service in the late war in the preparation of registrants and have given the profession a place among professional men that they should be very proud of.

Why not organize an association of Dental Veterans of the World War and make it a distinctively, independent organization? Later on you might wish to attach your organization to the Medical Veterans of the World War, which, of course, could be done with the consent of the officers of that organization.

I would suggest that you take this matter up with your state dental organization and if it meets with their approval, proceed to organize.

This, of course, is only a suggestion for your consideration.

I remain,

Sincerely,

HUBERT WORK.

(From Journal A. M. A.)

MEDICAL VETERANS OF THE WORLD'S WAR

There has been incorporated in the District of Columbia an organization to be known as the Medical Veterans of the World's War, and on November 15, 1918, the following was recorded:

CERTIFICATE OF INCORPORATION

KNOW ALL MEN BY THESE PRESENTS, THAT WE, the undersigned, all of whom are citizens of the United States, and a majority of whom are residents of the District of Columbia, desiring to associate ourselves together to form an association under the provisions of the Code of Law for the District of Columbia, enacted by Congress and approved by the President of the United States, hereby certify that,

First: The name of the association shall be Medical Veterans of the World War.

Second: The term for which it is organized shall be perpetual.

Third: The particular business, objects and purpose of the association are: To perpetuate fellowship, prepare history, secure co-operation for the mutual benefit of the medical men who served in the War of Nations, 1914-1918, and for the mutual improvement and social intercourse of its members.

Fourth: The number of trustees who shall manage the affairs of the association for the first year of its existence, and until otherwise provided, shall be seven, who shall be the incorporators named below; and nothing herein contained shall prevent the association in increasing the number of trustees for any subsequent year of its existence.

IN WITNESS WHEREOF we, Frederick F. Russell, Edward R. Stitt, James C. Perry, James S. Easby-Smith, Victor C. Vaughan, William J. Mayo and Hubert Work, have hereunto subscribed our names and affixed our seals this fifteenth day of November, A. D. 1918.

FREDERICK F. RUSSELL
EDWARD R. STITT
JAMES C. PERRY

JAMES S. EASBY-SMITH
VICTOR C. VAUGHAN
WILLIAM J. MAYO
HUBERT WORK

District of Columbia, ss:

I, N. Curtis Lammond, a Notary Public in and for the district aforesaid, do hereby certify that Frederick F. Russell, Edward R. Stitt, James C. Perry, James S. Easby-Smith, Victor C. Vaughan, William J. Mayo and Hubert Work, parties to a certain certificate of incorporation bearing date on the 15th day of November, A. D. 1918, and hereto annexed, personally appeared before me, in the district aforesaid, the said Frederick F. Russell, Edward R. Stitt, James C. Perry, James S. Easby-Smith, Victor C. Vaughan, William J. Mayo and Hubert Work being personally well known to me to be the persons who executed the said certificate, and acknowledged the same to be their act and deed for the purposes therein named.

Given under my hand and notary seal this 15th day of November, A. D. 1918.

N. CURTIS LAMMOND, Notary Public.

The several federal departments and civilian organizations co-operating in the formation of this new association are as follows:

INCORPORATORS

Colonel Frederick F. Russell
Rear Admiral Edward R. Stitt
Asst. Surg.-Gen. James C. Perry
Colonel James S. Easby-Smith
Colonel Victor C. Vaughan
Colonel William J. Mayo
Lieut.-Col. Hubert Work

REPRESENTING

The Surgeon-General of the Army
The Surgeon-General of the Navy
The Surg.-Gen. of Pub. H. Service
The Provost Marshal General
The Assn. of Mil. Surgeons
The Am. College of Surgeons
The American Medical Association

It is proposed that the membership of the Medical Veterans of the World's War shall include (a) all medical officers who have served in the Medical Corps of the U. S. Army, the U. S. Navy, and the U. S. Public Health Service; (b) all physicians who have been officially appointed by the President, Provost Marshal-General, or the Governors of States, and who have served as members of or medical examiners on Local, Medical Advisory and District Boards.

A temporary organization has been effected, and a committee appointed to draft a constitution and by-laws.

HUBERT WORK, President.
FREDERICK F. RUSSELL, Secretary.
Officers of the temporary organization.

THE ASSOCIATION OF THE MEDICAL VETERANS OF THE WORLD WAR

To Commissioned Officers in the Medical Corps of the United States Army, United States Navy, United States Public Health Service, and Medical Members of the Boards of the Selective Service System:

There has been incorporated and officered, the Association of Medical Veterans of the World War, with headquarters in Washington, D. C.

All physicians and surgeons commissioned in the Medical Reserve Corps, or Medical Corps of the United States Army, United States Navy, United States Public Health Service, medical members and medical examiners of Local, Medical Advisory and District Boards officially appointed by the President, or by the Governors of States, may become active members by signing the proper application and paying the nominal sum of \$1.

The Association of Medical Veterans of the World War is for the purpose of perpetuating fellowships formed in the military service of the United States, 1914 to 1918; promoting reunions of medical veterans; providing a common point of contact for organization of medical men already founded or to be later instituted, who took official part in winning the world war; for advancing medical science among its members, and for protecting those in need, through declining years.

It is expected that this organization may become the medium of association with foreign societies of medical war veterans, to the end that the medical profession of nations may continue to be allied, in harmony with the governments that made common cause and secured a common victory.

Special associations of medical war veterans, with membership restricted to States, to the selective service, specialists in medicine, overseas service, etc., are invited to elect delegates to represent them in the house of representatives, to which the government of the Medical Veterans of the World War will be entrusted, through the board of directors, to be elected by this house of representatives.

The first convention of the Medical Veterans of the World War, to be held in Atlantic City, N. J., during the second week in June, 1919, will be the Victory Meeting, at which the affairs of the association will be placed in the hands of its officers, to be elected at that time.

Physicians who are qualified by service in either of the Medical Corps of United States Government or because of having served by appointment as a member of one of the boards under the selective service system, are requested to submit applications for membership, stating the branch of service in which they have been engaged, together with their membership fee (\$1), to the secretary of the association, Col. Frederick F. Russell, care of the Office of the Surgeon-General of the Army, Washington, D. C.

FREDERICK F. RUSSELL, M.D., Washington, D. C.

Colonel, M. C., U. S. Army.

DR. FREDERICK LOVELL BOGUE

OBITUARY

FREDERICK LOVELL BOGUE, M.D., D.D.S.

MINUTE UPON HIS LIFE AND WORK PREPARED FOR THE FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK

Frederick Lovell Bogue, son of Edward A. and the late Amelia Lovell Bogue, was born at No. 29 East 20th Street, New York City, August 3d, 1870.

His paternal grandfather was a Presbyterian clergyman, and his maternal grandfather a Baptist clergyman, a missionary in India, where young Bogue's mother was born. She was a lady possessing much personal charm, a thorough musical education and considerable ability as an artist. Frederick's father, Edward A. Bogue, M.D., D.D.S., has been one of the world's best known dentists for many years, and is still in active practice. He still owns the house in Twentieth Street where the subject of this minute first saw the light. From New York City, the family residence was changed to Montclair, New Jersey, where F. L. Bogue attended a private school, then entered the Cheltenham Military Academy near Philadelphia, and, later on, he was a pupil at Dr. Holbrook's Military School on the Hudson. He then entered Hamilton College, where he passed more than two years, leaving college for the purpose of pursuing his education in Paris, where his father was in partnership with other American dentists.

After a year or more in Paris, young Bogue returned to this country, and matriculated at the dental department of the University of Pennsylvania, spending five years in the dental and medical departments, from which he graduated with both degrees—M.D. and D.D.S., in the year 1895.

Immediately after graduation, he began the practice of dentistry at No. 63 West Forty-eighth Street, New York City, in an office specially designed for him as an associate of his father, and after a few years, became a partner.

Soon after beginning practice, Dr. F. L. Bogue became an

active member of The New York Institute of Stomatology, then in the full tide of its prosperity, and in 1899 was chosen its editor, a position he held for many years. While in the University of Pennsylvania he attracted the favorable attention of Dr. James Truman, a professor there, the result being a close friendship which lasted until Dr. Truman's death. Becoming in a sense a protege of Dr. Truman's, Dr. Bogue's attention was turned toward the question of professional journalism, with which Dr. Truman was closely identified, and Dr. Bogue became a strong advocate of the cause.

When, therefore, the *International Dental Journal* ended its career with the year 1905, and the Institute of Stomatology, with three Massachusetts societies began the publication of THE JOURNAL OF THE ALLIED DENTAL SOCIETIES (as it is now called) in 1906, it was natural that young Dr. Bogue should be one of those most interested in the new magazine. As he had been the editor of the Institute since 1899—attending to the preparation of its proceedings for publication in the *International Dental Journal*—he took up the conduct of the new magazine with deep interest, energy and skill and was its acting editor for six years, the publication having no official editor until Dr. W. B. Dunning was elected to that position in 1912, at the Journal Conference in Boston.

The statement has often been made that dentists are too prone to accept as true the declarations of other dentists based upon more or less superficial investigation of professional matters of great importance. Dr. Bogue's comment, when some new pronouncement was made, always was in effect: "Very interesting, but is it so?" and he would take steps to prove or disprove the view expressed. Early in Dr. Bogue's professional career, many earnest men were investigating to fix, if possible, the causes of dental caries, the various reasons for the breaking down of enamel and dentin, whether due to special microbes, to the influence of environment, or to other reasons.

Drs. Black and Williams had stated in almost perfect agreement that so called "soft teeth" did not exist, but that different environment accounted for the decay of some teeth, while others remained without blemish.

Dr. Bogue was greatly interested in these investigations, and, desirous of proof at first hand, he installed apparatus in his laboratory from the working of which for several years he made careful records, intending to tabulate and publish the findings when satisfied that he had arrived at proved conclusions.

In February, 1901, before the N. Y. Institute of Stomatology, he contributed a notable paper based upon these studies, entitled "Relative Effect of a Common Environment upon Enamel," a thoughtful and logical presentation of some of his findings which received favorable comment both by those present, and, later, by many readers of the Institute proceedings. The re-reading of this earnest paper of Dr. Bogue's, even now, nearly eighteen years after its preparation, would repay anyone.

Dr. Bogue's intention was to follow this with other statements of his deductions, and he had much valuable material for the purpose, but ill health and the pressure of professional duties prevented.

Because of Dr. Bogue's desire to be of service to the poor and the unfortunate, he accepted a position upon the Board of Governors of the City Hospital on Blackwell's Island, and for three years spent two afternoons each week there, rendering dental service of diversified character, from extracting to treating jaw fractures, of which there were many.

A close and appreciative friend may surely be allowed to refer to the faults as well as to the virtues of one who has passed on. Dr. Bogue was of disposition so retiring and possessed such an extreme degree of modesty that he made comparatively few intimate friends, and received less appreciation than he deserved from his colleagues for his professional judgment and skill, which were far above the average. He often thought out a device or a plan for lessening a professional difficulty with which his name should have ever been connected, but his way was to speak of such things only to his intimates, and then in a casual and modest way. He was an orthodontist of high degree, though not a graduate of any school of orthodontia. His knowledge of the underlying principles of the science seemed almost innate, and if there ever was a dentist who understood the art of "orthodontia made easy"—to use a phrase sometimes the cause

of humorous allusion—it was Dr. Frederick L. Bogue. Some important orthodontic methods and devices, later claimed by others, were the children of his brain, and for which he would ever have received the credit had he been less modest, less reticent.

Dr. Bogue possessed a keen sense of humor, was quick to see a point, and to reply thereto with one usually brighter and more amusing.

At such a time of merry repartee, he was the life of any party, his face alight, his eyes expressive.

Most professional men recognize the advisability of having one or more hobbies, the pursuit and cultivation of which give restful relief from the more or less monotonous demands of their daily work. Dr. Bogue's avocations were varied and healthful, being connected for the most part with out of door activities. His knowledge of flowers was broad, and floral culture gave him the greatest satisfaction of all the forms of recreation he utilized for relief from professional cares.

He inherited from his mother an artistic taste which was not only useful to him in his profession, but also found expression in occasional pleasing combinations of color on canvas.

Dr. Bogue's interest in athletic sports was broad and unusual, his knowledge having been gained through participation early in life in most of the better out door sports. At both preparatory school and at college, he was one of the best amateur baseball pitchers of his time, and he knew football thoroughly from its scientific side. He fully appreciated the need for recreation, and often expressed pity for men of serious mien who could take no pleasure in games.

During the last few years of his life, when ill health prevented participation in all activities, even walking, Dr. Bogue spent much of his vacation periods in automobiling, of which he was very fond, and his knowledge of mechanics enabled him to understand and to keep in good order the essential parts of his car.

Dr. Bogue was generous, charitable and kind, a loyal friend, sincere and dependable; a skillful practitioner possessing much initiative, and a vision regarding the future high and higher

standing of the profession he loved so well. Surely the world and dentistry are the better for his life and his work.

Died at his home in Montclair, New Jersey, October 26, 1918, in his forty-ninth year, Frederick Lovell Bogue.

SEBERT ELLSWORTH DAVENPORT.

FREDERICK L. BOGUE, M.D., D.D.S.

DIED OCTOBER 26, 1918

MINUTE ADOPTED BY THE ASSOCIATION OF THE ALLIED DENTAL SOCIETIES, INCORPORATED

Whereas, The sad news has come to us of the passing from this life of FREDERICK L. BOGUE, and

Whereas, Doctor Bogue, as the first Editor of THE JOURNAL OF THE ALLIED DENTAL SOCIETIES, served well and faithfully, with self-sacrifice and enthusiasm, during many years of struggle in the upbuilding of this JOURNAL, and

Whereas, The Dental Profession has lost a wise and capable practitioner and a valiant worker in the cause of Professional Journalism;

Now therefore, be it RESOLVED:

That the ASSOCIATION OF THE ALLIED DENTAL SOCIETIES, INCORPORATED, records hereby the sorrow of its members in parting with a friend both near and dear; and that the memory of Doctor Bogue's life and work be cherished by them as a source of inspiration.

Resolved further, That a copy of this minute, with heartfelt sympathy, be presented to the family of Doctor Bogue.

LELAND BARRETT,

Secretary.

S. E. DAVENPORT,

President.

DR. C. EDSON ABBOTT

A wide circle of friends will mourn the loss of Dr. C. Edson Abbott, who died suddenly of pneumonia, at Franklin, Mass., December 27, 1918.

Dr. Clarence Edson Abbott was born in Randolph, Vt., December 9, 1880, the son of Dr. and Mrs. Edward C. Abbott, both of old New England families. His parents moved to Franklin, Massachusetts, when he was a young child, and there he grew up and spent most of his life.

Dr. Abbott's early education was obtained in the public schools of Franklin, graduating from Horace Mann High School, 1898. He entered the University of Pennsylvania in 1899, and graduated in 1902 with the degree of D.D.S. At entrance he won first place in the Competitive Scholarship Examination. In school he participated in various student activities, on chess team, track team and the department football team, and was on the *Pennsylvania Dental Journal* staff. On graduation he succeeded to his father's practice at Franklin. He continued steadily to pursue the study and advances of dental surgery and for the past ten years had been editor of the Massachusetts Dental Society (of which this JOURNAL is the official organ). He was also a member of the extracting staff of the Forsyth Dental Infirmary, Boston, and for the past two years had given one day a week to that infirmary.

Dr. Abbott took a very active part for many years in the affairs of the Massachusetts Dental Society. In this regard a close friend writes: "He had unusual business and executive ability. Through his introduction of the budget system, he placed Massachusetts Dental Society financially on its feet, and it now has proved so successful as to have thousands of dollars in its treasury, instead of being always behind in financial matters as previously. Dr. Abbott's ability was also brought out in business ventures outside of his profession. For instance, he established in Franklin a selling agency for different makes of automobiles, which proved a happy venture financially. He also served on many important committees in his town, and there was highly respected and acknowledged as one of their prominent citizens."

DR. C. EDSON ABBOTT

He was a member of Franklin Excelsior Lodge, A. F. & A. M., and of the Franklin Business Men's Association. He had also served as secretary of the town's finance committee for several years, and was at one time president of the Franklin High School Alumni Association. While not a member, he was a regular attendant at the First Congregational Church and had been particularly active in the men's society of the church. A man of high principle and integrity, progressive and alert, he took interest in all worthy movements and causes.

Dr. Abbott was a sturdy advocate of professional journalism, and his aggressive optimism at the various Journal Conferences in recent years did much to stir his hearers to greater efforts in support of this JOURNAL. Downright and forceful in body and mind, Dr. Abbott's vision went "home to the instant need of things." He never hesitated, minced matters or doubted a conviction once formed—and never wasted an extra word or second of time in stating his case. While his extreme directness of manner was not always understood by those who knew him slightly, his many friends knew him to be a warm hearted, lovable man, upon whose integrity they might depend.

Dr. Abbott's intuitive judgment made him a good prophet. Only a week or two before his last sickness he wrote his enthusiastic approval of the recent decision to combine the Journal of the Allied Dental Societies with the new Journal of Dental Research, and in so doing reminded the writer of this brief sketch that he had, some time before, advised and predicted exactly what had come to pass. The loss of his bright and positive personality is deeply felt in these days in which constructive power is everywhere needed.

Dr. Abbott was married at Natick, Mass., July 14, 1904, to Miss Lillian Favour. He is survived by Mrs. Abbott and four children.

W. B. DUNNING.

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Abbreviations: abs., abstract; disc., discussion; rev., review; edt., editorial; ed., editor.

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